



*3117 Scanner
Hardware Reference
Library*

Hardware Maintenance and Service



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Second Edition (October 1986)

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FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

Warning: This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the operating instructions, reference manuals, and the service manuals, may cause interference to radio or television reception. It has been tested and found to comply with the limits for a Class B computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a residential installation.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the equipment with respect to the receiver.
- Move the equipment away from the receiver.
- Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.
- Ensure that card mounting screws, attachment connector screws, and ground wires are tightly secured.
- Ensure that card slot covers are in place when no card is installed.
- If peripherals not offered by IBM are used with this equipment, use shielded, grounded cables with in-line filters, if necessary.

If necessary consult your dealer service representative for additional suggestions.

(Continued on the next page)

(Continued)

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. It is the responsibility of the user to correct such interference.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

How To Identify & Resolve Radio-TV Interference Problems

This booklet is available from the US Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

Warning: To comply with FCC regulations on electromagnetic interference for Class B computing device, be sure to use:

- IBM Communications Adapter Cable (Part Number 1502067) or IBM Personal Computer AT Serial Adapter Cable (Part Number 6450217)

or

- Scanner Cable (Part Number 6456816).

The above FCC statement applies only to those machines used in the U.S.

CAUTION: The product described herein is equipped with a grounded plug for the user's safety. It is to be used in conjunction with a properly grounded receptacle to avoid electrical shock.

Safety

This product meets IBM safety standards.

The following information has been included in this publication for the use and safety of IBM personnel. For more information, see:

- *Electrical Safety for IBM Service Representatives, S229-8124*
- *Safety/Health Guidelines for IBM Service Representatives, S241-5493*

General Safety during Work

Use these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during maintenance and after completing it.
- Use only field-supply items (such as adhesives, cleaning fluids, lubricants, paints, and solvents) that have been approved by IBM, that is, are supplied under an IBM part number.
- When lifting any heavy object:
 1. Ensure that you can stand safely without slipping.
 2. Balance the weight of the object between your two feet.
 3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
 4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles

in your back. *Do not attempt to lift any objects that you think are too heavy for you.*

- Do not perform any action that causes hazards to the customer or that makes the equipment unsafe.
- Put removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Always keep your tool case away from walk areas so that other persons will not trip over it; for example, put it under a desk or table.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or are rolled up above the elbows. If your hair is long, fasten it.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

Remember: A metal object lets more current flow if you touch a live conductor.

- Insert the ends of your necktie or scarf inside other clothing or fasten the necktie with a clip, preferably nonconductive, approximately 8 centimeters (3 inches) from the ends.
- Wear safety glasses when you are:
 - Using a hammer to drive pins or similar parts
 - Drilling with a power hand-drill
 - Using spring hooks or attaching springs
 - Soldering parts
 - Cutting wire or removing steel bands
 - Cleaning parts with solvents, chemicals, or cleaning fluids

- Working in any other conditions that might be hazardous to your eyes.
- Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
- After maintenance, reinstall all safety devices such as shields, guards, labels, and ground wires. Exchange any safety device that is worn or defective for a new one.

Remember: Safety devices protect personnel from hazards. You destroy the purpose of the devices if you do not reinstall them before completing your service call.

- Reinstall all covers correctly before returning the machine to the customer.

Safety with Electricity

Observe these additional rules when working on equipment powered by electricity:

- Find the room emergency power-off (EPO) switch or disconnecting switch. If an electrical accident occurs, you can then operate the switch quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages. Always inform your manager of any possible problem or if you must work alone.
- Disconnect all power:
 - Before removing or installing main units
 - Before working near power supplies
 - Before doing a mechanical inspection of power supplies
 - Before installing changes in machine circuits.

- Before you start to work on the machine, unplug the machine's power cable. If you cannot unplug the cable easily, ask the customer to switch off the wall box switch that supplies power to the machine, and either:
 - Lock the wall box switch in the off position, or
 - Attach a DO NOT OPERATE tag, Z229-0237, to the wall box switch.

Note: A non-IBM attachment to an IBM machine can be powered possibly from another source and controlled by a different disconnecting switch or circuit breaker. If you determine that this condition is present, ensure that you remove (eliminate) this hazard before you start work.

- If you need to work on a machine that has *exposed* electrical circuits, observe the following precautions:
 - Ensure that another person, who is familiar with the power-off controls, is near you.

Remember: Another person must be there to switch off the power, if necessary.

- **CAUTION**
Some IBM hand tools have handles covered with a soft material that does not insulate you when working with live electrical circuits.

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Use only those tools and testers that are suitable for the job you are doing.

- Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.

Remember: There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through the vital parts of your body.

- When using testers, set the controls correctly and use the IBM-approved probe leads and accessories intended for that tester.

- **CAUTION**

Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this wrong type of mat to protect yourself from electric shock.

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Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

- Observe the special safety precautions when you work with very high voltages; these instructions are given in IBM safety service memorandums (SMs) and the safety sections of maintenance information. Use extreme care when measuring high voltages.
- Do not use tools or testers that have not been approved by IBM. Ensure that electrical hand tools, such as power drills and Wire-Wrap¹ tools, are inspected regularly.
- Do not use worn or broken tools and testers.

¹ Trademark of the Gardner-Denver Co.

- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been switched off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are: moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the glass surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Unless the maintenance information specifically lets you, do not service the following parts *with power on them* when they are removed from their normal operating places in a machine:

Power supply units
Pumps
Blowers and fans
Motor generators

and similar units. (This rule ensures correct grounding of the units.)

- If an electrical accident occurs:
 - **Use caution; do not become a victim yourself.**
 - **Switch off power.**
 - **Send another person to get medical aid.**
 - **If the victim is not breathing, decide whether to give rescue breathing.**

These actions are described below.

Emergency First Aid

When giving rescue breathing after an electrical accident:

- *Use Caution.* If the victim is still in contact with the electrical-current source, remove the power; to do this, you may need to use the room emergency power-off (EPO) switch or disconnecting switch.

If you cannot find the switch, use a dry wooden rod or some other nonconductive object to pull or push the victim away from contact with the electrical-current source.

- *Work Quickly.* If the victim is unconscious, he or she possibly needs rescue breathing. If the heart has stopped beating, the victim may also need external cardiac compression.

Only a trained and certified person² should perform external cardiac compressions.

- *Get Medical Aid.* Call a rescue group, an ambulance, or a hospital immediately.

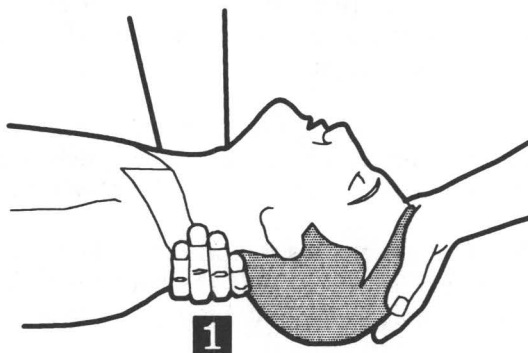
Rescue Breathing Procedures

Determine if the victim needs rescue breathing:

1. Prepare the victim:
 - a. Ensure that the victim's airway is open and not obstructed. Check the mouth for objects (such as chewing gum, food, dentures, or the tongue) that can obstruct the flow of air.

² If you want to be trained in giving this aid, ask a suitable organization (such as the Red Cross) in your area.

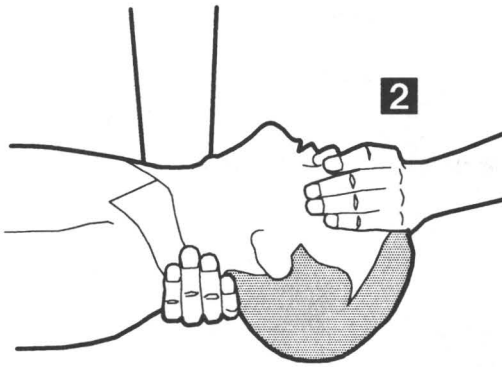
- b. Place the victim on his or her back, then put one hand under the victim's neck and the other hand on the victim's forehead.
- c. Lift the neck with one hand **1** and press the forehead backward with the other hand.



2. *Look, listen, and feel* to determine if the victim is breathing freely:
 - a. Put your cheek near the victim's mouth and nose.
 - b. Listen and feel for the breathing-out of air. At the same time, look at the victim's chest and upper abdomen to see if they move up and down.

If the victim is not breathing correctly and you decide that you want to give rescue breathing:

3. Continue to press on the victim's forehead with your hand and pinch together the victim's nostrils **2** with the thumb and finger.



4. CAUTION

Use extreme care when giving rescue breathing to a victim who possibly has breathed-in toxic fumes. *Do not breathe-in air that the victim has breathed-out.*

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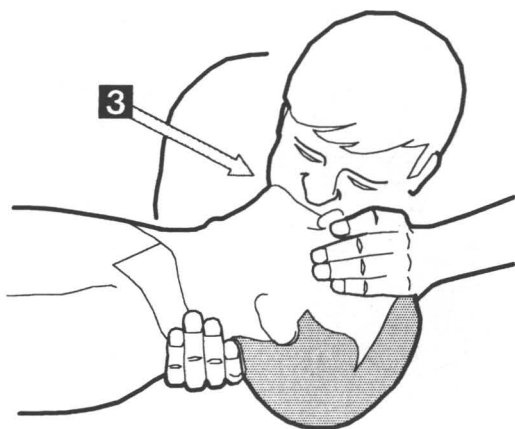
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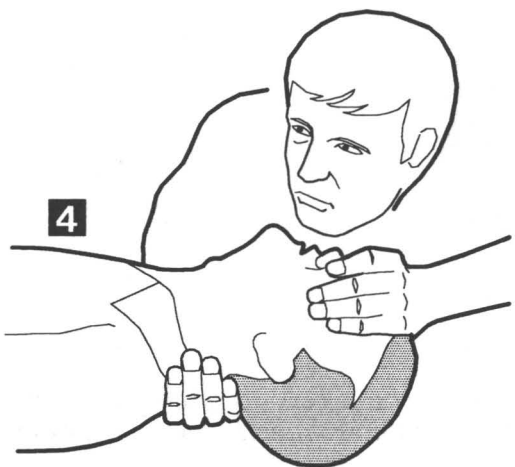
.....

Open your mouth wide and take a deep breath. Make a tight seal with your mouth³ around the victim's mouth **3** and blow into it.

³ A rescue-breathing face covering (mask) or similar unit can be used if you have been taught how to use it.



5. Remove your mouth and let the victim breathe out while you check that the victim's chest **4** moves down.



6. Repeat steps 4 and 5 once every 5 seconds until the victim breathes normally again or until medical aid comes.

Reporting Accidents

Report to your manager or to your IBM site all accidents, possible hazards, and accidents that nearly occurred.

Remember: An accident that nearly occurred can be caused by a design problem. Quick reporting ensures quick solving of the problem.

Report also each small electric shock, because the conditions that caused it need only differ slightly to cause serious injury.

Safety Inspection Guide

The purpose of this inspection guide is to help you identify potentially unsafe conditions on this product. Each unit, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

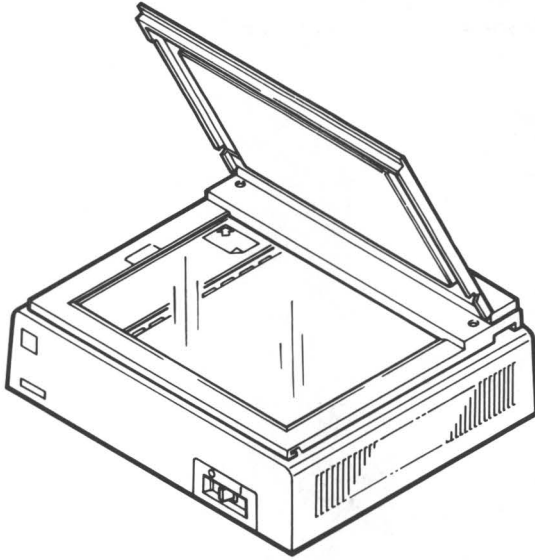
Consider these conditions and the safety hazards they present:

- **Electrical hazards, especially primary power:** Primary voltage on the frame can cause serious or fatal electrical shock.
- **Explosive hazards:** A damaged CRT face or bulging capacitor can cause serious injury.
- **Mechanical hazards:** Loose or missing hardware can cause serious injury.

We recommend all non-IBM devices and attachments be removed from the unit before you conduct the safety inspection.

CAUTION

Set the power switch of the Scanner to O (Off) and unplug the power cord from the wall outlet.



Check that the:

- External covers have no sharp edges, burrs, or damage.
- Glass is not damaged.
- Power cord has not been modified.
- Power rating plate is installed on the bottom of the Scanner.
- Line voltage matches to the voltage described on the power rating plate.

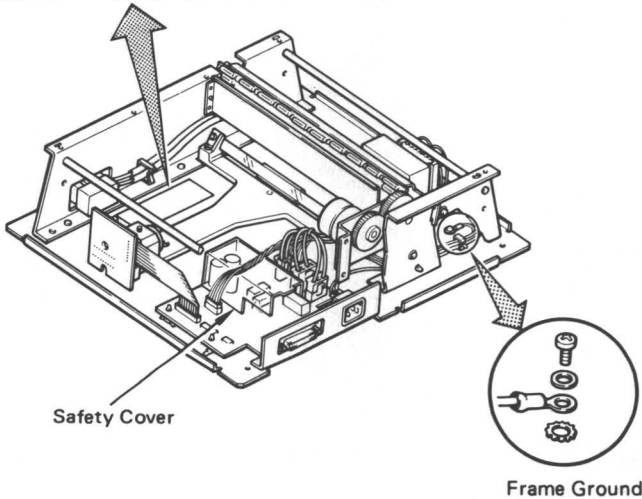
CAUTION

Set the power switch of the Scanner to **O (Off)** and unplug the power cord from the wall outlet.

Remove the main cover (see page 4-4).

Warning Label

• HAZARDOUS AREA TRAINED SERVICE PERSONNEL ONLY
• ZONE DANGEREUSE PERSONNEL QUALIFIE SEULEMENT
• AREA PERIGOSA SOMENTE PESSOAL TECNICO TREINADO
• AREA PELIGROSA SOLO PERSONAL CUALIFICADO
• GEFAHRL BEREICH NUR FUR FACHPERSONAL!
• 危険箇所 専門の技術員以外の取り扱い禁止



Check that the:

- Cables are correctly routed; not worn, pinched, or frayed.
- Frame ground is correctly installed.
- HAZARDOUS AREA label is installed.
- Safety cover is installed.
- Inside of the Scanner has no sharp edges or burrs.
- Power switch operates correctly.

Preface

Start all repair actions for the IBM 3117 Scanner in this manual.

This manual is intended for service representatives and includes the information needed to isolate and repair failures of the IBM 3117 Scanner.

The user of this manual should be trained on the IBM Personal Computer system which the IBM 3117 Scanner is attached.

This manual is organized as follows:

Section 1, "General Information" provides a general description of the IBM 3117 Scanner.

Section 2, "Introduction to Diagnostics" describes the IBM 3117 Scanner advanced diagnostic tests and 3117 Extension Unit diagnostic test. These tests isolate failures to a field replaceable unit (FRU).

Section 3, "Maintenance Analysis Procedures (MAPs)" describes the step-by-step procedures to isolate failures.

Section 4, "Repair Information" provides the information needed to remove and replace the field replaceable units (FRUs) and shows the locations of the various components.

Section 5, "Jumpers" shows the locations of the jumpers on the 3117 Scanner Adapter.

Section 6, "Parts Catalog" provides information and the IBM part numbers for the FRUs.

Appendix A, “Maintenance Analysis Procedures (MAPs) for 3117 Extension Unit Attachment” describes the step-by-step procedures to isolate failures in the Scanner using the 3117 Extension Unit diagnostic test.

Appendix B, “Sample Chart” provides a sample chart for scanning. Use the chart if needed.

Associated Publications

- *Guide to Operations — IBM 3117 Scanner*
- *Technical Reference — IBM 3117 Scanner*
- *Hardware Maintenance and Service — High Speed Adapter*
- *IBM Personal Computer Hardware Maintenance Service.*
- *IBM Personal Computer Hardware Maintenance Reference.*

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Appendix A. Maintenance Analysis Procedures (MAPs) for 3117 Extension Unit Attachment A-1

MAP 7970: Start (3117 Extension Unit Attachment)	A-7970-1
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Appendix B. Sample Chart B-1

Section 1. General Information

The IBM 3117 Scanner is a desk-top, flat-bed type, image-capturing device which is attached to the IBM Personal Computer or to the IBM 3193 Display Station. When the IBM 3117 Scanner is attached to the IBM Personal Computer, application programs in the IBM Personal Computer control all functions of the IBM 3117 Scanner. When the IBM 3117 Scanner is attached to the IBM 3193 Display Station, application programs in a host system control all functions of the IBM 3117 Scanner.

The image, which can be any document, is lighted by a lamp and scanned by a charge coupled device (CCD) image sensor. The output signals are sent to the IBM Personal Computer via an adapter cable and adapter, or to the IBM 3193 Display Station via the 3117 Extension Unit and a communication adapter cable. Scanning resolution for paper width and length is determined by the application program and can be one of the following:

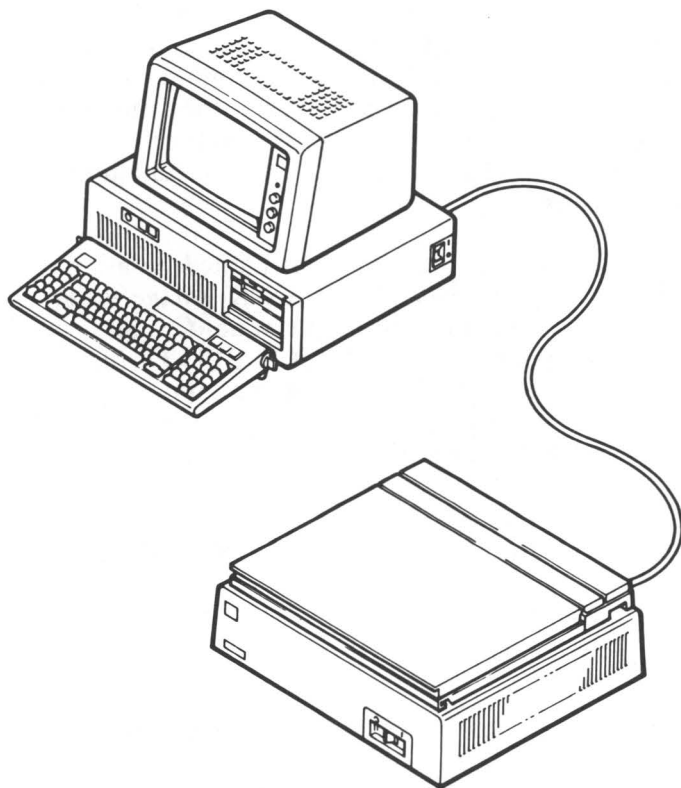
- 240 PELs by 240 PELs (picture elements per inch)
- 240 PELs by 120 PELs
- 120 PELs by 120 PELs.

The maximum document weight that can be placed on the Scanner is 1 kilograms (2.2 pounds).

Sample Configurations

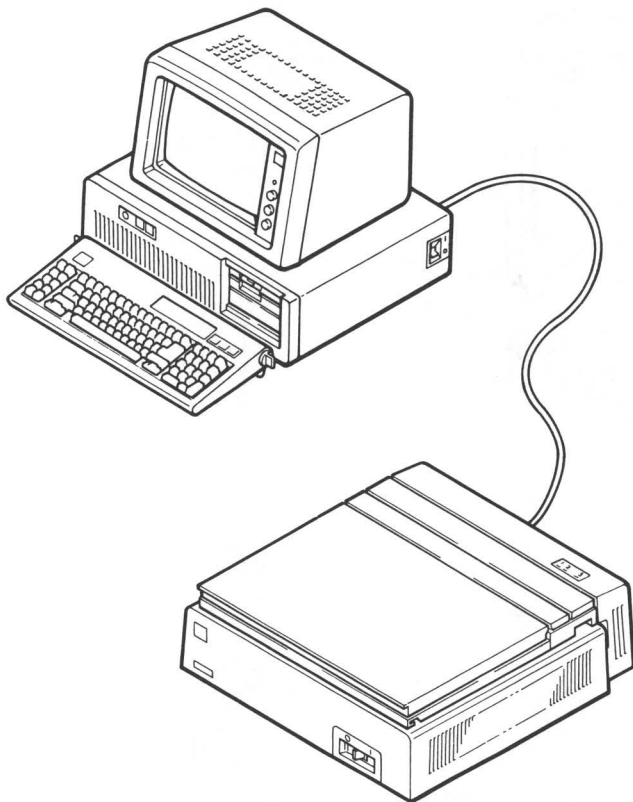
This section shows some sample configurations for the IBM 3117 Scanner.

Attachment to the IBM Personal Computer



Note: The 3117 Scanner Adapter should be installed in the system unit.

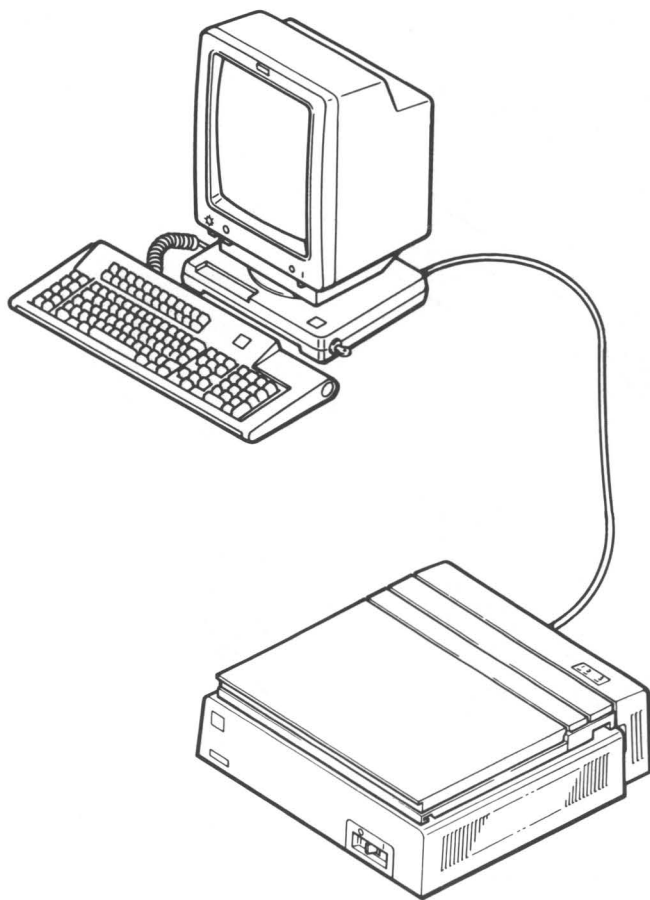
Attachment to the IBM Personal Computer



Notes:

1. The 3117 Extension Unit is needed.
2. The communication adapter cable is connected to the asynchronous communication adapter or to the serial port on the serial/parallel adapter.
3. When the High Speed Adapter option is installed, the communication adapter cable is connected to the High Speed Adapter.

Attachment to the IBM 3193 Display Station



Note: The 3117 Extension Unit is needed.

Environmental Specifications

Size and Weight — Scanner Unit

- Width: 385 millimeters (15.2 inches)
- Depth: 340 millimeters (13.4 inches)
- Height: 126 millimeters (5.0 inches)
- Weight:
 - 120 V ac machine; 8.7 kilograms (19.1 pounds)
 - 100 V ac machine; 8.9 kilograms (19.6 pounds)
 - 220/240 V ac machine; 9.1 kilograms (20 pounds).

Size and Weight — 3117 Extension Unit

- Width: 365 millimeters (14.4 inches)
- Depth: 55 millimeters (2.2 inches)
- Height: 110 millimeters (4.3 inches)
- Weight: 1 kilograms (2.2 pounds).

Air Temperature Requirement

- During Operation: 10.0°C to 40.6°C (50°F to 105°F)
- During Storage: 0.6°C to 60°C (33°F to 140°F)

Relative Humidity

- During Operation: 8 % to 80 %
- During Storage: 5 % to 80 %

Electrical Requirement

- 100 V ac machine
 - Minimum: 90 V ac
 - Maximum: 110 V ac
- 120 V ac machine
 - Minimum: 104 V ac
 - Maximum: 127 V ac
- 220/240 V ac machine

Note: The selection to 220 or 240 V ac is made by the selector switch located on the bottom of the Scanner.

When set to 220 V ac:

- Minimum: 198 V ac
- Maximum: 242 V ac

When set to 240 V ac:

- Minimum: 216 V ac
- Maximum: 264 V ac

- Wattage
 - 3117 Scanner Adapter attachment
 - During Operation — 40 watt
 - Stand-by — 5 watt
 - 3117 Extension Unit attachment
 - During Operation — 70 watt
 - Stand-by — 35 watt
- Frequency: 50 or 60 Hz
 - Tolerance: ± 0.5 Hz.

Acoustic Noise Emission

The following chart shows the typical noise emission values of the IBM 3117 Scanner.

L_{WAd}	Operating (bels)	3.5
	Idling (bels)	—
L_{pAm}	Operating (dB)	22.6
	Idling (dB)	—
$<L_{pA}>_m$	Operating (dB)	20
	Idling (dB)	17
Impulsive Noise		No
Prominent Discrete Tones		No

Notes:

L_{WAd} is the declared sound power emission level for a production series of machines.

L_{pAm} is the mean value of the sound pressure emission levels at the operator position (if any) for a production series of machines.

$<L_{pA}>_m$ is the mean value of the space-averaged sound pressure emission levels at the one-meter position for a production series of machines.

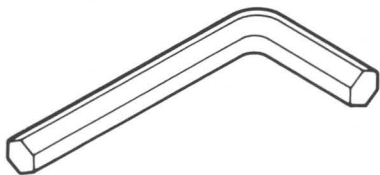
— Not applicable.

All measurements made in accordance with ISO DIS 7779, and reported in conformance with ISO DIS 7574/4.

Special Tools

The following special tool is required to service the Scanner:

- Wrench, part number 450373
(Included in the miscellaneous parts kit)



Section 2. Introduction to Diagnostics

You do not have to read this section each time service is required, but until you have a good understanding of the diagnostic aids, this section will serve as a useful reference.

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Notes:

Diagnostic Overview

There are two ways to diagnose Scanner problems:

- **Scanner Advanced Diagnostic Tests**

To run the scanner advanced diagnostic tests, you need:

- A system unit (with the 3117 Scanner Adapter installed and a minimum memory size of 512K bytes)
- A keyboard
- A diskette drive (with Scanner Advanced Diagnostics diskette)
- An IBM color display and adapter
- The IBM 3117 Scanner.

- **3117 Extension Unit Diagnostic Test**

To run the 3117 Extension Unit diagnostic test, you need the:

- 3117 Extension Unit
- The IBM 3117 Scanner.

Scanner Advanced Diagnostic Tests

The scanner advanced diagnostic tests are programs (stored on a diskette) that test Scanner functions. The tests are also used to verify the operation after a repair action.

If the tests find a problem, an error message appears. Error messages are used with the MAPs to find the failing FRU.

Note: Make a copy of the Scanner Advanced Diagnostics diskette and put the original in a safe place.

Loading Scanner Advanced Diagnostic Tests

To load the advanced diagnostic tests for the IBM 3117 Scanner:

1. Set the power switch of the system unit (and expansion unit, if attached) to **Off**.
2. Insert the Scanner Advanced Diagnostics diskette (label up and toward you) into diskette drive A.
3. Close the diskette drive lever.
4. Ensure the display is working.
5. Set the power switch of the Scanner to **I** (On).
6. Set the power switch of the expansion unit (if attached) to **On**.
7. Set the power switch of the system unit to **On**.

After power-on self test (POST) of the system unit completes, the advanced diagnostic tests program is loaded and Menu 1 appears on the display.

Diagnostic Menu Reference

This section shows the menus for the scanner advanced diagnostic tests and describes what each menu selection does.

Menu 1

THE IBM 3117 SCANNER
ADVANCED DIAGNOSTICS

Version X.XX (C) Copyright IBM Corp. 19XX

SELECT AN OPTION

0 - RUN DIAGNOSTIC ROUTINES
9 - EXIT TO SYSTEM DISKETTE

ENTER THE ACTION DESIRED
? _

- 0 - **RUN DIAGNOSTIC ROUTINES** - Starts the system checkout procedure (goes to Menu 2).
- 9 - **EXIT TO SYSTEM DISKETTE** - Loads the program from the diskette in drive A.

Menu 2

The path to Menu 2 is from Menu 1.

THE INSTALLED DEVICES ARE

79 - S SCANNER ADAPTER

IS THE LIST CORRECT (Y/N) ? _

Y - Goes to the system checkout menu (Menu 3).

N - Shows error code **199**. Check that the 3117 Scanner Adapter is installed correctly. If the 3117 Scanner Adapter is installed correctly, replace the 3117 Scanner Adapter.

Menu 3

The path to Menu 3 is from:

- Menu 1
- Menu 2.

SYSTEM CHECKOUT

0 - RUN TESTS ONE TIME

9 - EXIT DIAGNOSTIC ROUTINES

ENTER THE ACTION DESIRED

? _

0 - RUN TESTS ONE TIME - Runs the diagnostic tests once (goes to Menu 4).

9 - EXIT DIAGNOSTIC ROUTINES - Returns to Menu 1.

Menu 4

The path to Menu 4 is from:

- Menu 1
- Menu 2
- Menu 3

TESTING - SCANNER

- 0 - SCANNER ADAPTER TEST
- 1 - SCANNER DEVICE TEST
- 2 - SCANNER FAULT LOCATION TEST
- 9 - EXIT SCANNER TEST

ENTER THE ACTION DESIRED

? _

- 0 - SCANNER ADAPTER TEST** - Tests the 3117 Scanner Adapter. Disconnecting the scanner cable from the system unit is required.
- 1 - SCANNER DEVICE TEST** - Tests the Scanner by scanning a document and displaying the scanned image on the display (see "Operation of the Scanner Device Test by the Scanner Advanced Diagnostic Tests" on page 2-10 for a detailed description).
- 2 - SCANNER FAULT LOCATION TEST** - Tests the power supply logic and the table movement (goes to Menu 5).
- 9 - EXIT SCANNER TEST** - Returns to Menu 3.

Menu 5

The path to Menu 5 is from:

- Menu 1
- Menu 2
- Menu 3
- Menu 4 (2 - **SCANNER FAULT LOCATION TEST**).

SCANNER FAULT LOCATION TEST

- 0 - POWER SUPPLY TEST
- 1 - TABLE MOVEMENT TEST
- 9 - EXIT FAULT LOCATION TEST

ENTER THE ACTION DESIRED

? _

- 0 - **POWER SUPPLY TEST** - Tests the power supply logic (see "Operation of the Power Supply Test by the Scanner Advanced Diagnostic Tests" on page 2-12 for a detailed description).
- 1 - **TABLE MOVEMENT TEST** - Tests the table movement operation. (see "Operation of the Table Movement Test by the Scanner Advanced Diagnostic Tests" on page 2-13 for a detailed description).
- 9 - **EXIT FAULT LOCATION TEST** - Returns to Menu 4.

Operation of the Scanner Device Test by the Scanner Advanced Diagnostic Tests

Place a document on the glass before you run this test.

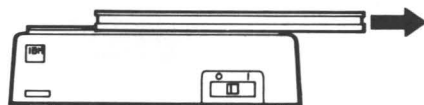
Note: You can use the sample chart on page B-2 for scanning.

When this test runs, the Scanner operates as follows:

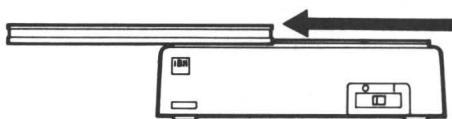
1. Start (home position)



2. The lamp goes on and the table unit moves to the right limit.



3. The table unit moves to the left.



4. The lamp goes off and the table unit returns to the home position.



Note: If an error occurs up to this step, the following error code appears.

Error Code	Meaning
7901	3117 Scanner Adapter error
7902	Scanner error
7903	Scanner cable error

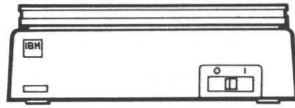
5. The scanned image appears on the display with 1/16 scale. Check the scanned image by using the following keys:
 - To show the scanned image with a 1/1 scale, press the **[F1]** key.
 - To show the scanned image with a 1/4 scale, press the **[F2]** key.
 - To show the scanned image with a 1/16 scale, press the **[F3]** key.
 - To scroll, press the **[↑]**, **[↓]**, **[→]**, or **[←]** key.
 - To scroll up one screen, press the **[PgUp]** key.
 - To scroll down one screen, press the **[PgDn]** key.
 - To show the left side, press the **[Home]** key.
 - To show the right side, press the **[End]** key.
 - To advance to the bottom-right, hold down the **[Ctrl]** key and press the **[End]** key.
 - To return to the top-left, hold down the **[Ctrl]** key and press the **[Home]** key.
 - To return to Menu 4, press the **[F9]** key.

This completes the Scanner Device Test.

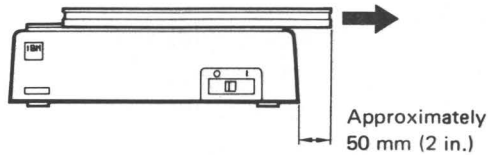
Operation of the Power Supply Test by the Scanner Advanced Diagnostic Tests

When this test runs, the Scanner operates as follows:

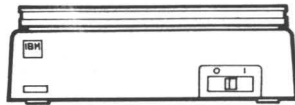
1. Start (home position)



2. The lamp goes on and the table unit moves to the right about 50 millimeters (2 inches).



3. The lamp goes off and the table unit returns to the original position.

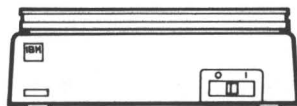


Because this test does not show any error code on the display, check the operation visually.

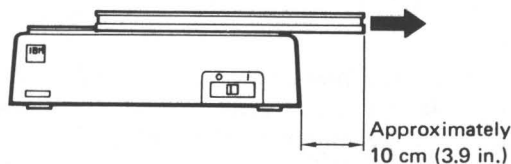
Operation of the Table Movement Test by the Scanner Advanced Diagnostic Tests

When this test runs, the Scanner operates as follows:

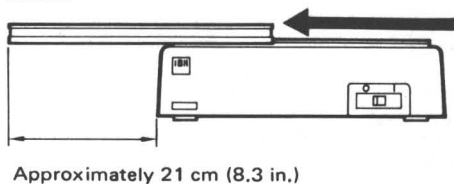
1. Start (home position)



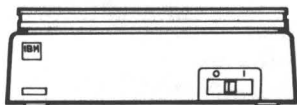
2. The lamp goes on and the table unit moves to the right limit.



3. The lamp goes off and the table unit moves to the left limit.



4. The table unit returns to the home position.



Steps 1 through 4 are repeated five times. Wait for the test completes.

If an error occurs, error code **7902** appears.

3117 Extension Unit Diagnostic Test

The 3117 Extension Unit diagnostic test verifies the Scanner operation by running:

- Power-on self test (POST) of the 3117 Extension Unit
- Table movement test.

The three indicators show the test status (see below and page 2-17).

Running Power-On Self Test of 3117 Extension Unit

Each time you set the power switch of the Scanner to I (On), the power-on self test runs. After POST completes, the Scanner goes into the normal operating mode. POST takes about 7 seconds to complete, and when it completes successfully, indicators 1 and 3 are on and indicator 2 is off.

Operating Mode Indicator List

Indicator			Meaning
1	2	3	
On	On	On	During POST
On	Off	On	Ready
NA	NA	Off	Power is not applied
Off	Off	On	3117 Extension Unit problem
Off	Blink	On	Scanner or 3117 Extension Unit problem
Blink	Off	On	Not ready

NA: Either On, Off, or Blinking

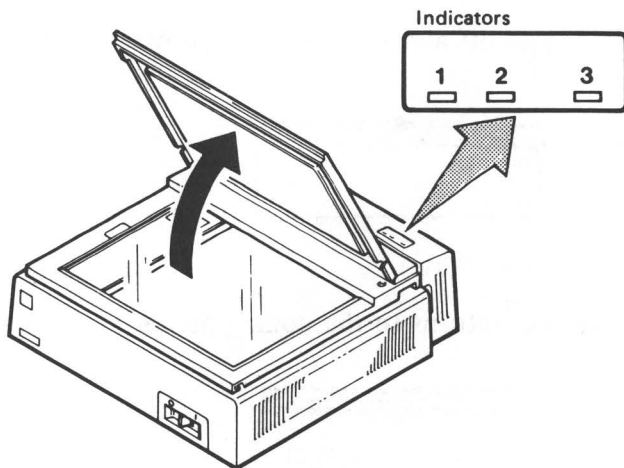
Running the Table Movement Test by the 3117 Extension Unit

To run the table movement test:

1. Set the power switch to **O** (Off).
2. Move the table unit to the home position.
3. Open the top cover and remove any paper on the glass.
4. Set the power switch to **I** (on).

POST starts.

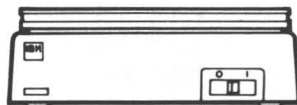
- a. Indicators 1, 2, and 3 go on.
- b. The lamp starts blinking.
- c. Indicator 1 starts blinking.



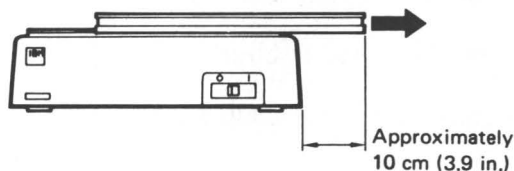
5. Close the top cover. The table movement test starts and the Scanner operates as follows:

Note: Steps 5a through 5d are repeated until you set the power switch to **O** (Off).

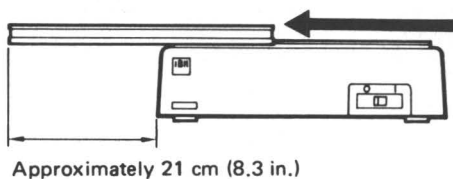
- a. Start (home position)



- b. The lamp goes on and the table unit moves to the right limit.



- c. The lamp goes off and the table unit moves to the left limit.



- d. The table unit returns to the home position.



Continued on the next page.

6. Wait for the table unit to reach the right limit position at least twice.
7. The three indicators show the test result. Check the status of three indicators and see the list below for the meaning of the indicators.

Table Movement Test Indicator List

Indicator			Meaning or FRU
1	2	3	
Blink	On	On	Normal condition
Off	Off	On	3117 Extension Unit problem
Blink	Blink	On	Top-marker not found 1. Dirty top-marker 2. Device card 3. Optic assembly 4. Transformer assembly
Blink	Off	On	Image processing error 1. Dirty white band 2. Device card 3. 3117 Extension Unit 4. Optic assembly 5. Transformer assembly
On	Blink	On	Table movement error 1. Motor assembly 2. Pinion, Guide rail 3. Device card

Note: The FRUs are listed in order of most-probable to least-probable cause.

Maintenance Analysis Procedures (MAPs)

Always begin with the Start MAP.

The MAPs are a series of steps that request you to answer questions and perform some actions. You will be able to determine which field replaceable unit (FRU) is causing the failure by following the MAPs and running the scanner advanced diagnostic tests or 3117 Extension Unit diagnostic tests.

To complete the repair, the MAPs may direct you to:

- Other sections of this manual
- The IBM Personal Computer *Hardware Maintenance Service* manual.

If you are to diagnose the Scanner problem using the 3117 Extension Unit diagnostic test, go to Appendix A, "Maintenance Analysis Procedures (MAPs) for 3117 Extension Unit Attachment" on page A-1.

Section 3. Maintenance Analysis Procedures (MAPs)

Contents

MAP 0100: Start	3-0100-1
MAP 7900: Scanner	3-7900-1
MAP 7901: 3117 Scanner Adapter	3-7901-1
MAP 7950: Scanner Cable	3-7950-1
MAP 7960: 3117 Extension Unit	3-7960-1

Notes:

MAP 0100: Start

This is the entry point for all IBM 3117 Scanner MAPs. The MAPs will help you determine the failing field replaceable unit (FRU).

To continue in this MAP, you must have the following units:

- A system unit (with the 3117 Scanner Adapter installed and a minimum memory size of 512K bytes)
- A keyboard
- A diskette drive (with Scanner Advanced Diagnostics diskette)
- An IBM color display and adapter
- The IBM 3117 Scanner
- The scanner cable.

If you are to diagnose the Scanner problem using the 3117 Extension Unit, go to Appendix A, "Maintenance Analysis Procedures (MAPs) for 3117 Extension Unit Attachment" on page A-1.

001

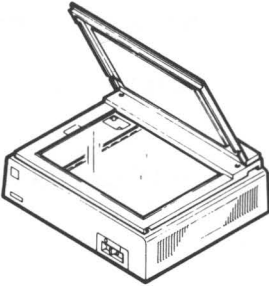
When a customer's equipment needs service, the customer is asked to send you one of the following:

- A system unit (or expansion unit) that contains the 3117 Scanner Adapter
- The IBM 3117 Scanner
- The scanner cable
- The 3117 Extension Unit.

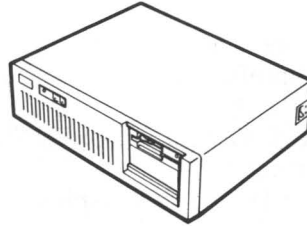
Continued on the next page.

Choose one from the figures below and go to the page described.

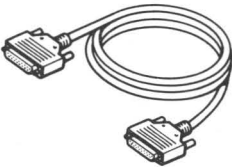
"MAP 7900: Scanner" on
page 3-7900-1.



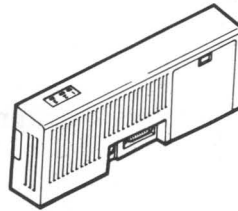
"MAP 7901: 3117 Scanner
Adapter" on page 3-7901-1.



"MAP 7950: Scanner Cable"
on page 3-7950-1.



"MAP 7960: 3117 Extension
Unit" on page 3-7960-1.



MAP 7900: Scanner

001

- Do not connect the Scanner to the system unit until you are directed.
- Power off the Scanner.
- If your Scanner has the 220/240 V ac selector switch, ensure the selector switch is set for the voltage available at the wall outlet.
- Check the Scanner and make sure that there are no missing or damaged parts (covers, glass, scanner cable, etc.).

Also check that the top marker and white band (bottom side of the table unit's left side) are clean. If these parts are not clean, the image darkness is affected or error code **7902** appears.

Is any part damaged, missing, or dirty?

Yes No

002

Go to Step 004 in this MAP.

003

Go to Section 4 and replace the missing or damaged part, or clean any dirty part.

004

(From Step 002 in this MAP)

- Move the table unit by hand. The table unit can be moved manually to the right or left.

Could you move the table unit?

Yes No

005

1. Remove the main cover (see Section 4).
2. Check the following for possible defects (worn, broken, or missing):
 - Rack on the bottom side of the table unit
 - Pinion
 - Front rail.

006

(Step 006 continues)

006 (continued)

- Power off the system unit.
- Power off all external devices.
- Remove all non-IBM devices and any modified options (options that have been changed for special use).
- Connect the Scanner to the system unit using the golden scanner cable.
- Get the Scanner Advanced Diagnostics diskette, and insert it into diskette drive A.
- Ensure the display is working.
- Power on the Scanner.
- Power on the expansion unit (if attached).
- Power on the system unit.

After POST (power-on self test) of the system unit completes, the Scanner advanced diagnostic tests program is loaded, and the following display should appear.

**THE IBM 3117 SCANNER
ADVANCED DIAGNOSTICS**

Version X.XX (C) Copyright IBM Corp. 19XX

SELECT AN OPTION

- 0 - RUN DIAGNOSTIC ROUTINES**
- 9 - EXIT TO SYSTEM DISKETTE**

ENTER THE ACTION DESIRED

? _

Did the above display appear?

Yes No

007

Replace the device card (see Section 4).

008

- Run the Scanner Device Test.

Note: If you do not know how to run the test, follow the instructions below.

1. Press **0** then press **Enter**.
2. Press **Y** then press **Enter**.

3. Press **0** then press **Enter**.
4. Press **1** then press **Enter**.
5. Follow the instructions on the display.
6. The scanned image will appear on the display with 1/16 scale.
7. Check the scanned image.

Did the scanned image appear on the display correctly?

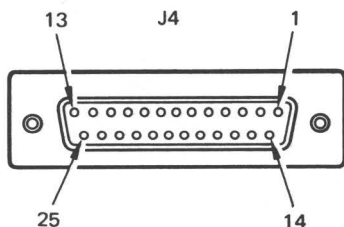
Yes No

009

Record all information associated with the symptoms.
Go to Step 013 in this MAP.

010

- Power off the Scanner.
- Disconnect the scanner cable from the Scanner.
- Measure the resistance between J4-2 and J4-15 for 0.5 to 2.0 ohms.



Is the resistance between 0.5 to 2.0 ohms?

Yes No

011

Replace the transformer assembly (see Section 4).

012

The Scanner is working correctly.

013

(From Step 009 in this MAP)

- Use the failure symptom list below to select the appropriate Step or follow the instruction described. (If you have multiple error codes or failure symptoms, go to the one listed first.)

Error Code or Failure Symptom	Step or Instruction
Lamp does not go off and error code 7902 appears.	Replace the device card (see Section 4).
Error Code 7902 appears.	Step 014 in this MAP
Error Code 7903 appears.	Replace the device card (see Section 4).
Scanned image problem.	Step 059 in this MAP.

014

(From Step 013 in this MAP)

- Power off the Scanner.
- Press **Enter**.
- Before continuing, check that the:
 - Top marker and white band (bottom side of the table unit's left side) are clean.
 - Table unit is at the home position.
 - Following is displayed.

TESTING - SCANNER

- 0 - SCANNER ADAPTER TEST
- 1 - SCANNER DEVICE TEST
- 2 - SCANNER FAULT LOCATION TEST
- 9 - EXIT SCANNER TEST

ENTER THE ACTION DESIRED

? _

- Power on the Scanner.
- Run the Power Supply Test.

Note: If you do not know how to run the test, follow the instructions below.

1. Press **2** then press **Enter**.
2. Press **0** then press **Enter**.

014 (continued)

Did the Scanner operate correctly?

Yes No

015

Go to Step 017 in this MAP.

016

Go to Step 062 in this MAP.

017

(From Step 015 in this MAP)

- Use the failure symptom list below and select the appropriate Step.

Failure Symptom	Step
The table unit does not move correctly and the lamp does not go on.	Step 018 in this MAP
The table unit moves correctly but the lamp does not go on.	Step 049 in this MAP
The table unit does not move correctly but the lamp goes on.	Step 067 in this MAP

018

(From Step 017 in this MAP)

- Power off the Scanner.
- Unplug the power cord from the wall outlet.
- Unplug the power cord from the Scanner.
- Check the continuity of the power cord.

Is the continuity of the power cord correct?

Yes No

019

Replace the power cord.

020

If you are servicing a 120 V ac machine, go to Step 021 in this MAP.

- or -

If you are servicing a 100 or 220/240 V ac machine, go to Step 033 in this MAP.

021

(From Step 020 in this MAP)

- Remove the main cover (see Section 4).
- Check that connector J1 is tightly connected to the device card.

Is connector J1 tightly connected to the device card?

Yes No

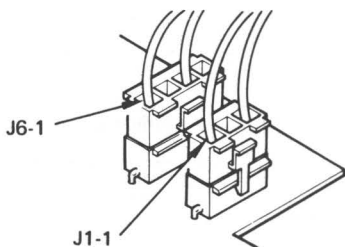


022

Connect it tightly to the device card.

023

- Check the continuity of the fuse on the device card. To check the continuity, measure the resistance between J1-1 and J6-1.



Is the fuse open?

Yes No



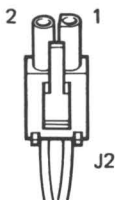
024

Go to Step 030 in this MAP.

025

- Disconnect connector J2 from the device card.
- Measure the resistance between the points listed below.

Points	Ohms
J2-1, J2-2	10 - 100



From Lamp

(Step 025 continues)

025 (continued)**Is the resistance more than 10 ohms?****Yes No**

| |

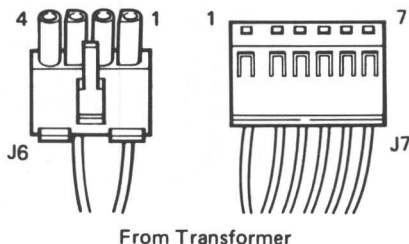
026

Replace the lamp assembly and device card (see Section 4).

027

- Disconnect connectors J6 and J7 from the device card.
- Measure the resistance between the points listed below.

Points	Ohms
J6-1, J6-3	7 - 13
J7-1, J7-3	0.5 - 2.0
J7-4, J7-5	1.5 - 3.5
J7-6, J7-7	6 - 11

**Are all the resistances correct?****Yes No**

| |

028

Replace the transformer assembly and device card (see Section 4).

029

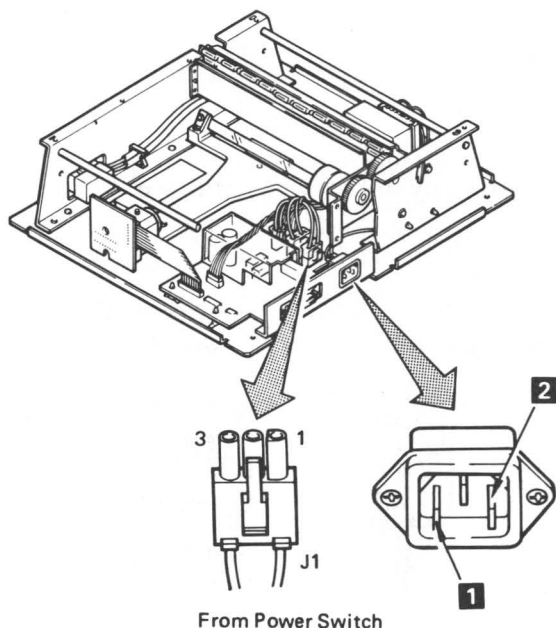
Replace the device card (see Section 4).

030

(From Step 024 in this MAP)

- Disconnect connector J1 from the device card.
- Measure the resistance between the points listed below.

Points	Power Switch	Ohms
J1-1, 2	I (On)	0 - 1
J1-1, 2	O (Off)	Infinite
J1-3, 1	I (On)	0 - 1
J1-3, 1	O (Off)	Infinite



Are all the resistances correct?

Yes

No

031

Replace the power switch assembly (see Section 4).

032

Replace the device card (see Section 4).

033

(From Step 020 in this MAP)

- Remove the main cover (see Section 4).
- Check that connector J8 is tightly connected to the transformer assembly.

Is connector J8 tightly connected to the transformer assembly?

Yes

No

034

Connect it tightly to the transformer assembly.

035

- Check the continuity of the fuse on the transformer assembly.

(Step 035 continues)

035 (continued)
Is the fuse open?

Yes No

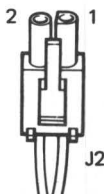
036

Go to Step 042 in this MAP.

037

- Disconnect connector J2 from the device card.
- Measure the resistance between the points listed below.

Points	Ohms
J2-1, J2-2	10 - 100



From Lamp

Is the resistance more than 10 ohms?

Yes No

038

Replace the lamp assembly and the fuse on the transformer assembly (see Section 4).

039

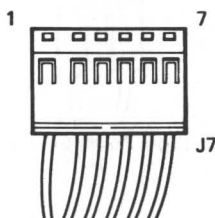
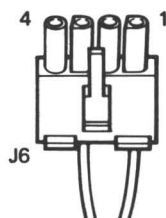
- Disconnect connectors J6 and J7 from the device card.
- Measure the resistance between the points listed below.

220/240 V ac Machine

Points	Ohms
J6-1, J6-3	18 - 33
J7-1, J7-3	0.5 - 2.0
J7-4, J7-5	1.0 - 2.5
J7-6, J7-7	7 - 13

100 V ac Machine

Points	Ohms
J6-1, J6-3	7 - 13
J7-1, J7-3	0.5 - 2.0
J7-4, J7-5	1.5 - 3.5
J7-6, J7-7	6 - 12



From Transformer

(Step 039 continues)

039 (continued)

Are all the resistances correct?

Yes No

040

Replace the transformer assembly (see Section 4).

041

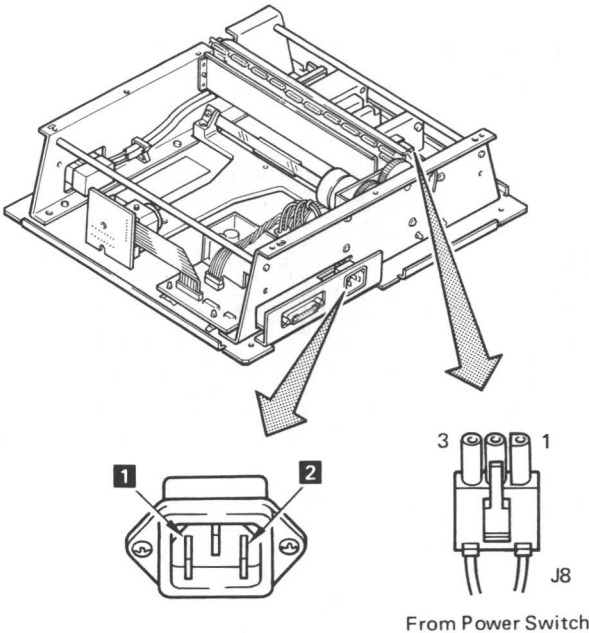
Replace the fuse on the transformer assembly.

042

(From Step 036 in this MAP)

- Disconnect connector J8 from the transformer assembly.
- Measure the resistance between the points listed below.

Points	Power Switch	Ohms
J8-1, 2	I (On)	0 - 1
J8-1, 2	O (Off)	Infinite
J8-3, 1	I (On)	0 - 1
J8-3, 1	O (Off)	Infinite



(Step 042 continues)

042 (continued)

Are all the resistances correct?

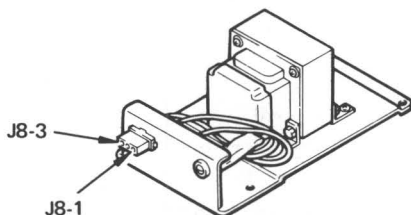
Yes No

043

Replace the power switch assembly (see Section 4).

044

- Measure the resistance between J8-1 and J8-3 at the transformer assembly side for 10 to 30 ohms.



Is the resistance between 10 and 30 ohms?

Yes No

045

Replace the transformer assembly (see Section 4).

046

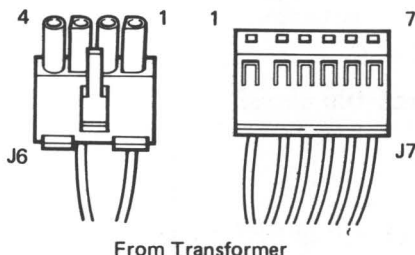
- Disconnect connectors J6 and J7 from the device card.
- Measure the resistance between the points listed below.

220/240 V ac Machine

Points	Ohms
J6-1, J6-3	18 - 33
J7-1, J7-3	0.5 - 2.0
J7-4, J7-5	1.0 - 2.5
J7-6, J7-7	7 - 13

100 V ac Machine

Points	Ohms
J6-1, J6-3	7 - 13
J7-1, J7-3	0.5 - 2.0
J7-4, J7-5	1.5 - 3.5
J7-6, J7-7	6 - 12



(Step 046 continues)

046 (continued)

Are all the resistances correct?

Yes No

047

Replace the transformer assembly (see Section 4).

048

Replace the device card (see Section 4).

049

(From Step 017 in this MAP)

- Power off the Scanner.
- Unplug the power cord from the wall outlet.
- Unplug the power cord from the Scanner.
- Remove the main cover (see Section 4).
- Check that connector J2 is tightly connected to the device card.

Is connector J2 tightly connected to the device card?

Yes No

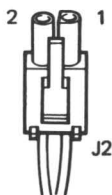
050

Connect it tightly to the device card.

051

- Disconnect connector J2 from the device card.
- Measure the resistance between the points listed below.

Points	Ohms
J2-1, J2-2	10 - 100



From Lamp

Is the resistance between 10 and 100 ohms?

Yes No

052

Replace the lamp assembly (see Section 4).

053

(Step 053 continues)

053 (continued)**Are you servicing a 120 V ac machine?**

Yes No

054

Go to Step 056 in this MAP.

055

Replace the device card (see Section 4).

056

(From Step 054 in this MAP)

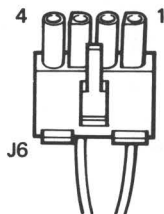
- Disconnect connector J6 from the device card.
- Measure the resistance between the points listed below.

220/240 V ac Machine

Points	Ohms
J6-1, J6-3	18 - 33

100 V ac Machine

Points	Ohms
J6-1, J6-3	7 - 13



From Transformer

Is the resistance correct?

Yes No

057

Replace the transformer assembly (see Section 4).

058

Replace the device card (see Section 4).

059

(From Step 013 in this MAP)

- Power off the Scanner.
- Check that the top marker and white band (bottom side of the table unit's left side) are clean.

Are the top marker and white band clean?

Yes No

(Step 060 continues)

060

Clean the top marker and white band (see Section 4).

- or -

Replace the table unit (see Section 4, "Main Cover Removal," steps 1 to 8).

061

- Press the **F9** key.

The following display appears.

TESTING - SCANNER

0 - SCANNER ADAPTER TEST

1 - SCANNER DEVICE TEST

2 - SCANNER FAULT LOCATION TEST

9 - EXIT SCANNER TEST

ENTER THE ACTION DESIRED

? _

- Press **2** then press **Enter**.

Go to Step 062 in this MAP.

062

(From Steps 016 and 061 in this MAP)

- Power off the Scanner.

- Ensure that the table unit is at the home position.

- Ensure the following is displayed.

SCANNER FAULT LOCATION TEST

- 0 - POWER SUPPLY TEST
- 1 - TABLE MOVEMENT TEST
- 9 - EXIT FAULT LOCATION TEST

ENTER THE ACTION DESIRED

? _

- Power on the Scanner.
- Press **1** then press **Enter**.

The **TABLE MOVEMENT TEST** starts. The table unit moves fully to the right and left five times.

Did error code 7902 appear?

Yes No

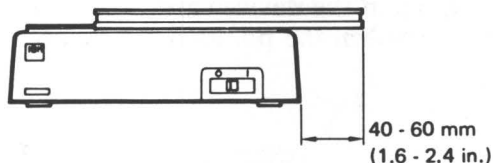
063

Go to Step 072 in this MAP.

064

The table unit may have stopped at an wrong position.

- Check that the table unit extends to the right side of the main cover 40 mm to 60 mm (1.6 to 2.4 in.).



Is the table unit at the position described above?

Yes No

065

Go to Step 067 in this MAP.

066

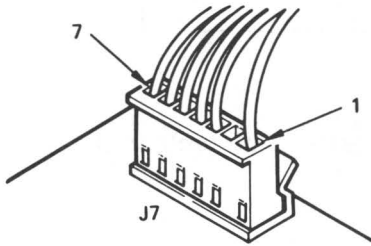
Go to Step 072 in this MAP.

067

(From Steps 017 and 065 in this MAP)

- Power off the Scanner.
- Disconnect the scanner cable from the Scanner.
- Remove the main cover (see Section 4).
- Plug in the power cord to the Scanner and wall outlet.
- Power on the Scanner.
- Measure the AC voltages between the points listed below.

Points	Min V ac	Max V ac
J7-4, J7-5	10	20
J7-6, J7-7	10	20



Are the voltages within the correct range?

Yes No

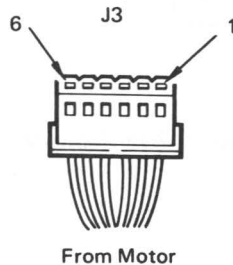
068

Replace the transformer assembly (see Section 4).

069

- Power off the Scanner.
- Disconnect connector J3 from the device card.
- Measure the resistances between the points listed below.

Points	Ohms
J3-1, J3-2	40 - 100
J3-2, J3-3	40 - 100
J3-4, J3-5	40 - 100
J3-5, J3-6	40 - 100



Are the resistances within the correct range?

Yes No

070

(Step 070 continues)

070 (continued)

Replace the motor assembly (see Section 4).

071

Replace the device card (see Section 4).

072

(From Steps 063 and 066 in this MAP)

- Power off the Scanner.
- Unplug the power cord from the wall outlet.
- Unplug the power cord from the Scanner.
- Disconnect the scanner cable from the Scanner and the system unit.
- Check that both sides (top and bottom) of the glass are clean.
- Check that the white board on the top cover is clean.

Are both sides of the glass (top and bottom) and the white board clean?

Yes No

|

073

Clean the dirty part (see Section 4).

- or -

Replace the dirty part (see Section 4).

074

- Remove the main cover (see Section 4).
- Inspect the mirror and lens on the optic assembly.

Are the mirror and lens clean and defect free?

Yes No

|

075

Clean the mirror and lens on the optic assembly (see Section 4).

- or -

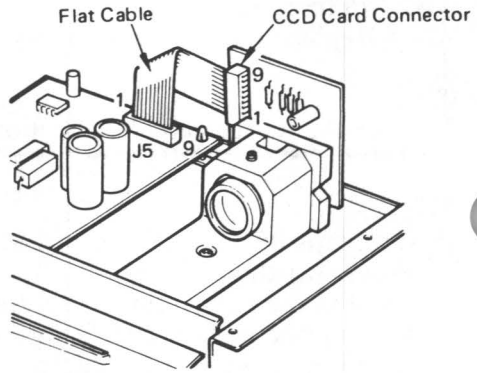
Replace the optic assembly (see Section 4).

076

- Check the continuity of the flat cable between the points listed below.

The meter should indicate between 0 to 1 ohms resistance.

CCD Card Connector	Connector J5
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9



Is the continuity of the flat cable correct?

Yes No

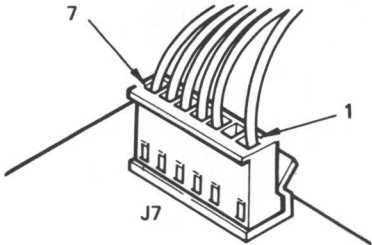
077

Replace the flat cable.

078

- Plug in the power cord to the Scanner and wall outlet.
- Power on the Scanner.
- Measure the **AC** voltages between the points listed below.

Points	Min V ac	Max V ac
J7-4, J7-5	10	20
J7-6, J7-7	10	20



Are the voltages within the correct range?

Yes No

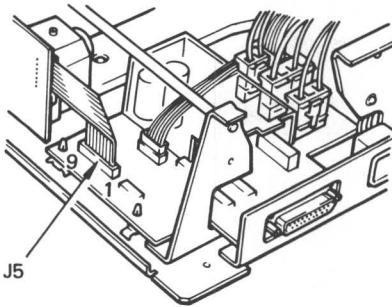
079

Replace the transformer assembly (see Section 4).

080

- Measure the **DC** voltage between the points listed below.

+Lead	-Lead	Min V dc	Max V dc
J5-5	J5-3	10.8	13.2



Is the voltage within the correct range?

Yes No

081

Go to Step 085 in this MAP.

082

- Power off the Scanner.
- Replace the device card (see Section 4).
- Run the Scanner Device Test.

Did the scanned image appear on the display correctly?

Yes No

083

Reinstall the original device card and replace the optic assembly (see Section 4).

084

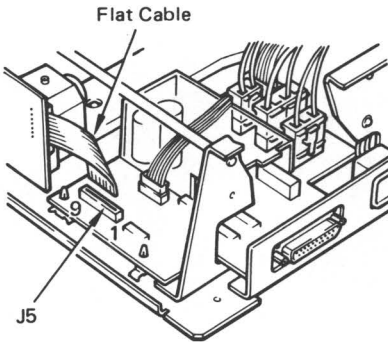
The problem has been corrected.

085

(From Step 081 in this MAP)

- Power off the Scanner.
- Disconnect the flat cable from the device card.
- Power on the Scanner.
- Measure the **DC** voltage between the points listed below.

+Lead	-Lead	Min V dc	Max V dc
J5-5	J5-3	10.8	13.2



Is the voltage within the correct range?

Yes No

086

Replace the device card (see Section 4).

087

Replace the optic assembly (see Section 4).

MAP 7901: 3117 Scanner Adapter

001

- Power off the system unit (and expansion unit, if attached).
- Power off all external devices.
- Remove all non-IBM devices and any modified options (options that have been changed for special use).
- Connect a keyboard and an IBM color display to the system unit.
- If the scanner cable is connected, disconnect it from the system unit.
- Insert the Scanner Advanced Diagnostics diskette into diskette drive A.
- Ensure the display is working.
- Power on the expansion unit (if attached).
- Power on the system unit.

After POST of the system unit completes, the scanner advanced diagnostic tests program is loaded, and the following display should appear.

THE IBM 3117 SCANNER ADVANCED DIAGNOSTICS

Version X.XX (C) Copyright IBM Corp. 19XX

SELECT AN OPTION

- 0 - RUN DIAGNOSTIC ROUTINES
- 9 - EXIT TO SYSTEM DISKETTE

ENTER THE ACTION DESIRED

? _

Did the above display appear?

Yes No

002

Go to Step 011 in this MAP.

003

- Press **0** then press **Enter**.
The following display should appear.

THE INSTALLED DEVICES ARE

79 - S SCANNER ADAPTER

IS THE LIST CORRECT (Y/N) ? _

Did the above display appear?

Yes No

004

Go to Step 014 in this MAP.

005

- Run the Scanner Adapter Test.

Note: If you do not know how to run the test, follow the instructions below.

1. Press **Y** then press **Enter**.
2. Press **0** then press **Enter**.
3. Press **0** then press **Enter**.
4. Follow the instructions on the display.

Did error code 7901 appear?

Yes No

006

Go to Step 008 in this MAP.

007

Replace the 3117 Scanner Adapter (see Section 4).

008

(From Step 006 in this MAP)

- Connect the Scanner (the Scanner, scanner cable, power cord) that is known to be good to the system unit.
- Power on the Scanner.
- Run the Scanner Device Test.

Did the scanned image appear on the display correctly?

Yes No

009

Replace the 3117 Scanner Adapter (see Section 4).

010

The 3117 Scanner Adapter is working correctly.

011

(From Step 002 in this MAP)

- Power off the system unit (and expansion unit, if attached).
- Power off all external devices.
- Remove the 3117 Scanner Adapter (see Section 4).
- Insert the Scanner Advanced Diagnostics diskette into diskette drive A.
- Power on the expansion unit (if attached).
- Power on the system unit.

After POST of the system unit completes, the scanner advanced diagnostic tests program is loaded, and the following display should appear.

**THE IBM 3117 SCANNER
ADVANCED DIAGNOSTICS**

Version X.XX (C) Copyright IBM Corp. 19XX

SELECT AN OPTION

- 0 - RUN DIAGNOSTIC ROUTINES**
- 9 - EXIT TO SYSTEM DISKETTE**

ENTER THE ACTION DESIRED

? _

Did the above display appear?

Yes No

(Step 012 continues)

012

Go to the "Start" MAP in your IBM Personal Computer *Hardware Maintenance Service* manual.

013

Replace the 3117 Scanner Adapter (see Section 4).

014

(From Step 004 in this MAP)

- Power off the system unit (and expansion unit, if attached).
- Power off all external devices.
- Remove the system unit cover.
- If the High Speed Adapter is installed in the system unit, set the memory assignment jumpers of both adapters (3117 Scanner Adapter and High Speed Adapter) to the primary.
- Reseat the 3117 Scanner Adapter.
- Insert the Scanner Advanced Diagnostics diskette into diskette drive A.
- Power on the expansion unit (if attached).
- Power on the system unit.
- After the SELECT AN OPTION frame appears; press **0** then press **Enter**.

The following display should appear.

THE INSTALLED DEVICES ARE

79 - S SCANNER ADAPTER

IS THE LIST CORRECT (Y/N) ? _

Did the above display appear?

Yes No

015

Replace the 3117 Scanner Adapter (see Section 4).

(Step 016 continues)

016

The problem has been corrected.

MAP 7901

Notes:

MAP 7950: Scanner Cable

001

- Check the scanner cable and make sure there are no damage on the cable and cable connectors (frayed or worn cable, loose or bent pins, etc.)

Did you find any damage?

Yes No

002

Go to Step 004 in this MAP.

003

Replace the scanner cable.

004

(From Step 002 in this MAP)

- Check that continuity exists between the same numbered pins of both connectors of the scanner cable.

Is the scanner cable continuity correct?

Yes No

005

Replace the scanner cable.

006

The scanner cable works correctly.

Notes:

MAP 7960: 3117 Extension Unit

001

- Check the 3117 Extension Unit and make sure there are no damage on the 3117 Extension Unit (cover, connectors).

Did you find any damage?

Yes No

002

Go to Step 004 in this MAP.

003

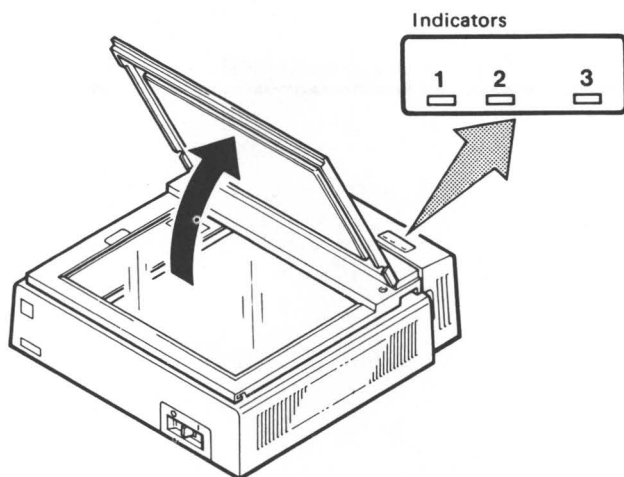
Replace the 3117 Extension Unit (see Section 4).

004

(From Step 002 in this MAP)

You are running the 3117 Extension Unit diagnostic test using the golden Scanner.

- Power off the Scanner.
- Plug in the power cord to the Scanner and wall outlet.
- Connect the 3117 Extension Unit to the golden Scanner.
- Move the table unit to the home position.
- Open the top cover.
- If there is any paper on the glass, remove it.
- If the communication adapter cable is connected to the 3117 Extension Unit, disconnect it.



(Step 004 continues)

004 (continued)

- Power on the Scanner.

POST starts.

- Wait for approximately 10 seconds.

Is the lamp blinking?

Yes No

005

Replace the 3117 Extension Unit.

006

Are indicator 1 blinking and indicators 2 and 3 on?

Yes No

007

Replace the 3117 Extension Unit.

008

- Close the top cover.

The table movement test starts.

- Wait until the table unit reaches the right limit at least twice.

Are indicator 1 blinking and indicators 2 and 3 on?

Yes No

009

Replace the 3117 Extension Unit.

010

The 3117 Extension Unit is working correctly.

Section 4. Repair Information

This section describes how to remove the field replaceable units (FRUs) and shows the locations of the various components.

To reinstall the FRU, reverse the removal procedures.

Always set the power switch to O (Off) and unplug the power cord from the wall outlet before performing any procedure in this section.

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Handling ESD-Sensitive Parts

To prevent damage, when working with electrostatic discharge (ESD) sensitive parts, observe the following instructions; do these in addition to all the usual precautions such as switching off power before removing and replacing logic cards.

- Keep the ESD-sensitive part in its original shipping container (a special ESD bag) until you are ready to install the part into the machine.
- Make the least possible movement with your body to prevent an increase of static electricity from clothing fibers, carpets, and furniture.
- Just before touching the ESD-sensitive part, discharge to the machine any static electricity in your body; do this by touching the metal frame or cover of the machine. If possible, keep one hand on the frame when inserting or removing a logic card, for example.
- Hold the ESD-sensitive part by its edge or connector shroud (cover); *do not touch its pins*. If you are removing a pluggable module, use the correct tool.
- Do not place the ESD-sensitive part on the machine cover or on a metal table; if you need to put down the ESD-sensitive part for any reason, first put it into its special bag. Machine covers and metal tables are electrical grounds. They increase the risk of damage because they make a discharge path from your body through the ESD-sensitive part. (Large metal objects can be discharge paths without being grounded.)
- Prevent ESD-sensitive parts from being accidentally touched by other personnel such as customers or other service personnel. Reinstall machine covers when you are not working on the machine, and do not put unprotected ESD-sensitive parts on a table.
- If possible, keep all ESD-sensitive parts in a grounded metal cabinet or case.
- Be very careful in working with ESD-sensitive parts when cold-weather heating is used because low humidity increases static electricity.

Cleaning the Optic Assembly

Do not touch the mirror and lens on the optic assembly. If the mirror and lens are dirty, the image quality is affected. If these parts are dirty, clean them using isopropyl alcohol (IBM part number 2200200) and lintfree cloth (IBM part number 2108930) or lintfree tissue (IBM part number 2162567), or equivalents.

Cleaning the White Board, Glass, Top Marker, and White Band

If these parts are dirty, clean them using isopropyl alcohol (IBM part number 2200200) and lintfree cloth (IBM part number 2108930) or lintfree tissue (IBM part number 2162567), or equivalents.

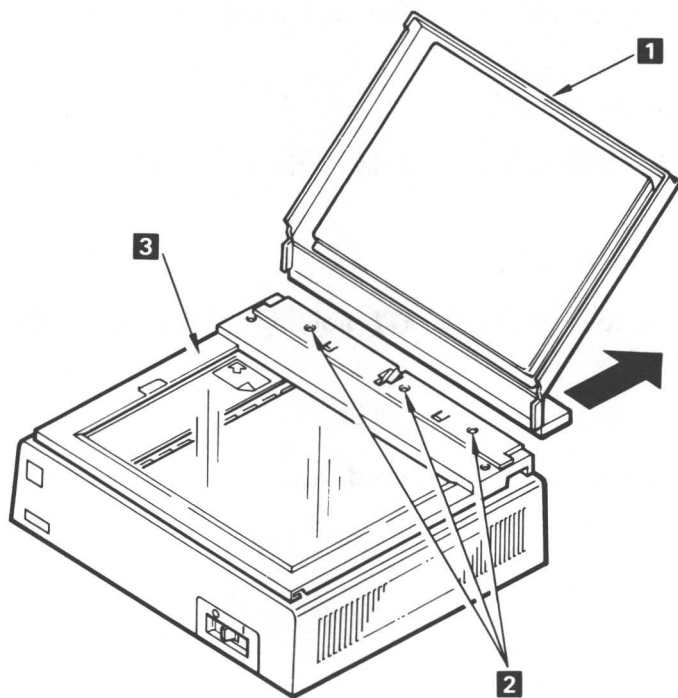
Removal and Replacement Procedures

Main Cover Removal

1. Set the power switch of the system unit (and expansion unit, if attached) to **Off**.
2. Set all external power switches (printer, display, etc.) to **O** (Off).
3. Set the power switch of the Scanner to **O** (Off).
4. Unplug the power cord of the Scanner from the wall outlet.
5. Disconnect the scanner cable from the rear of the system unit.
6. Remove the top cover **1** by sliding it to the rear.
7. Remove the three screws **2** holding the table unit **3** to the rear rail.
8. Remove the table unit **3**.

Note: The front end of the table unit goes under the front rail.

Continued on page 4-6.

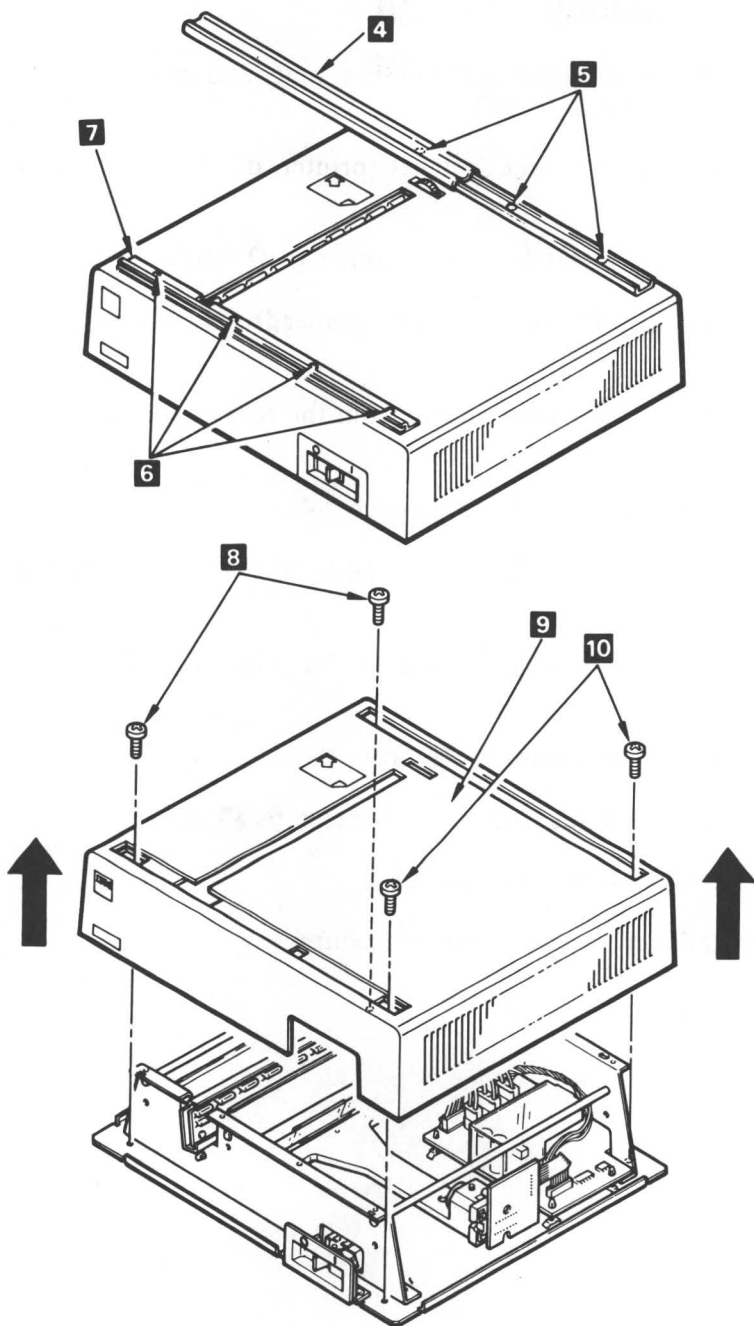


Main Cover Removal — 1

Main Cover Removal (Continued)

9. Remove the four screws **6** holding the front rail **7** to the frame (one screw requires the wrench in the miscellaneous parts kit).
10. Remove the front rail **7** .
11. Remove the three screws **5** holding the rear rail **4** to the frame.
12. Remove the rear rail **4** .
13. Remove the four screws **8** , **10** holding the main cover **9** to the frame.
14. Lift and remove the main cover **9** .

To reinstall, reverse the above procedures.

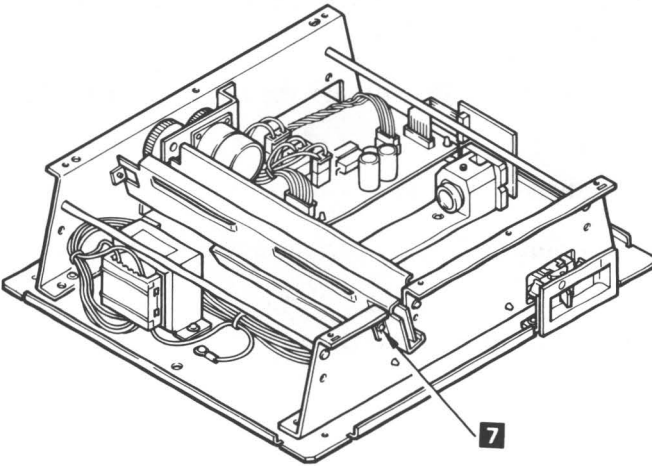
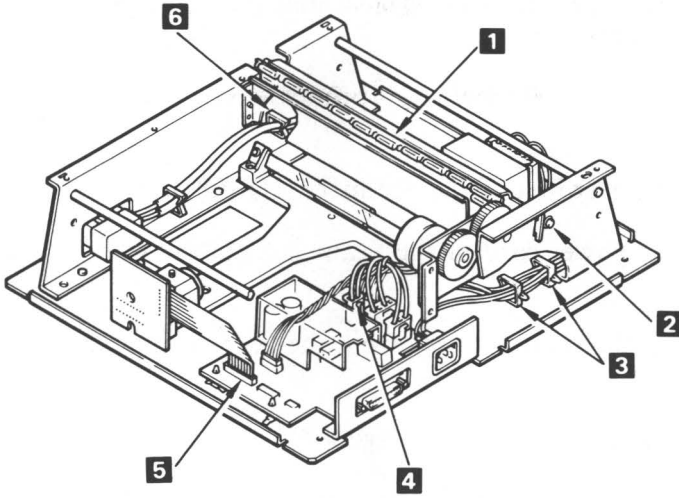


Main Cover Removal — 2

Lamp Assembly Removal

1. Set the power switch of the system unit (and expansion unit, if attached) to **Off**.
2. Set all external power switches (printer, display, etc.) to **Off**.
3. Set the power switch of the Scanner to **Off**.
4. Unplug the power cord of the Scanner from the wall outlet.
5. Disconnect the scanner cable from the rear of the system unit.
6. Remove the main cover (see page 4-4).
7. Remove the screw **2** holding the lamp assembly **1** to the rear frame.
8. Remove the screw **7** holding the lamp assembly **1** to the front frame.
9. Disconnect connector J2 **4** from the device card **5**.
10. Remove the wires from the three clamps **3** , **6** .
11. Remove the lamp assembly **1** .

To reinstall, reverse the above procedures.



Lamp Removal

Optic Assembly Removal

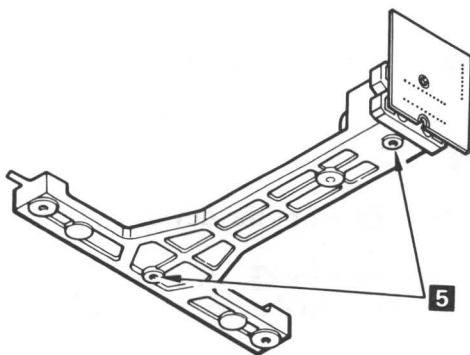
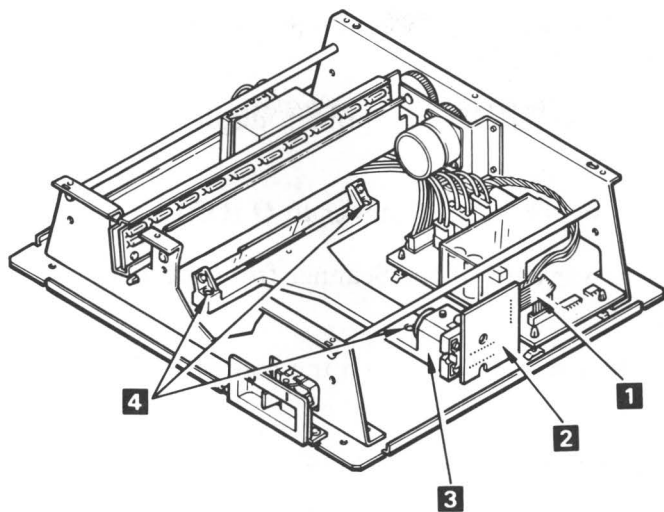
1. Set the power switch of the system unit (and expansion unit, if attached) to **Off**.
2. Set all external power switches (printer, display, etc.) to **Off**.
3. Set the power switch of the Scanner to **Off**.
4. Unplug the power cord of the Scanner from the wall outlet.
5. Disconnect the scanner cable from the rear of the system unit.
6. Remove the main cover (see page 4-4).
7. Disconnect the flat cable **1** from the CCD card **2**.
8. **Warning:** Be careful not to damage the mirror and lens when you remove the screws **4**.

Remove the three screws **4** holding the optic assembly **3** to the frame.

9. Remove the optic assembly **3**.

Note: The two pins **5** set the correct position of the optic assembly.

To reinstall, reverse the above procedures.



Optic Assembly Removal

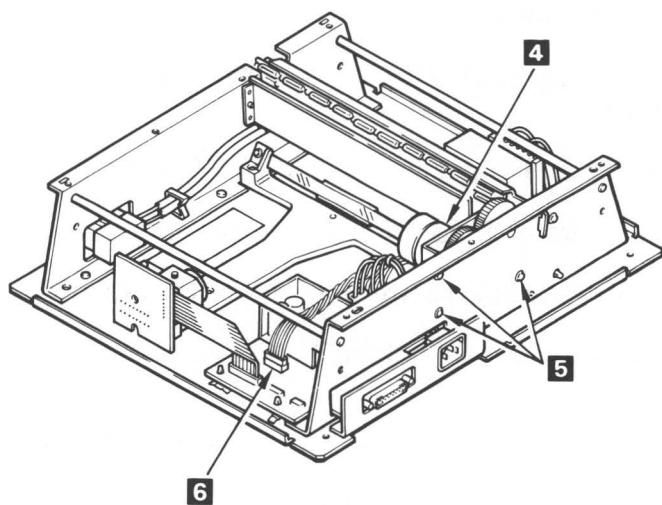
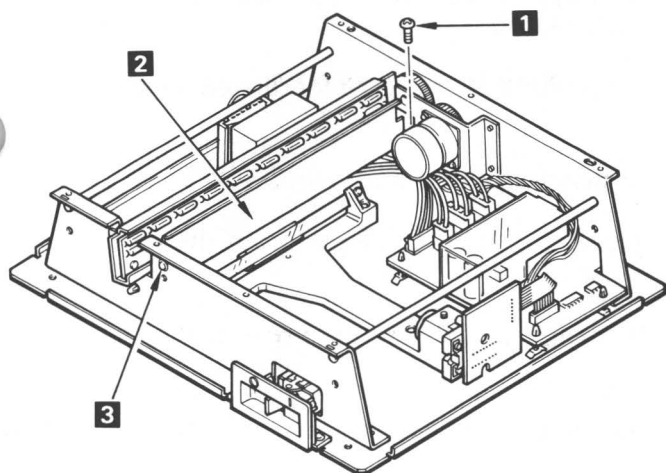
Motor Assembly Removal

1. Set the power switch of the system unit (and expansion unit, if attached) to **Off**.
2. Set all external power switches (printer, display, etc.) to **Off**.
3. Set the power switch of the Scanner to **Off**.
4. Unplug the power cord of the Scanner from the wall outlet.
5. Disconnect the scanner cable from the rear of the system unit.
6. Remove the main cover (see page 4-4).
7. Remove the lamp assembly (see page 4-8).
8. Remove the screw **3** holding the plate **2** to the front frame.
9. Remove the screw **1** holding the plate **2** to the motor bracket.
10. Remove the plate **2**.
11. Disconnect connector J3 **6** from the device card.
12. **Warning:** When the three screws **5** are removed, the motor drops. Be careful not to damage the mirror.

Remove the three screws **5** holding the motor bracket to the rear frame.

13. Remove the motor assembly **4**.

To reinstall, reverse the above procedures.



Motor Removal

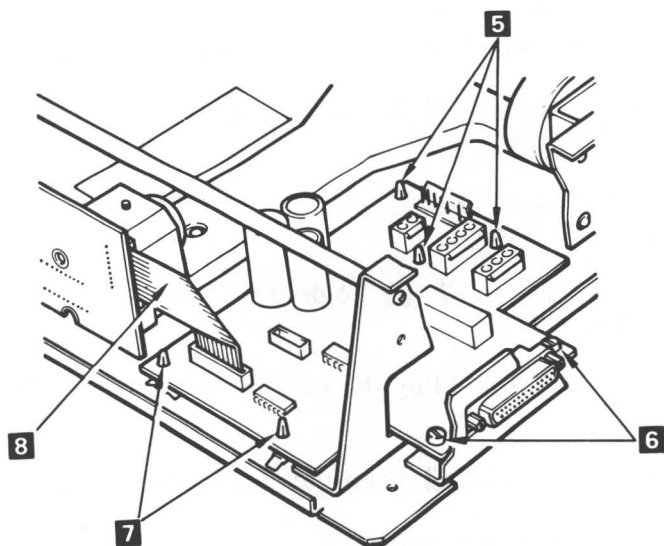
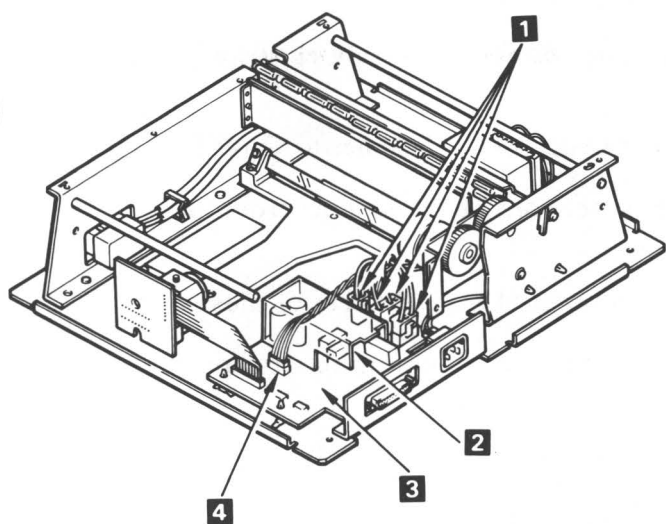
Device Card Removal

1. Set the power switch of the system unit (and expansion unit, if attached) to **Off**.
2. Set all external power switches (printer, display, etc.) to **O** (Off).
3. Set the power switch of the Scanner to **O** (Off).
4. Unplug the power cord of the Scanner from the wall outlet.
5. Disconnect the scanner cable from the rear of the system unit.
6. Disconnect the scanner cable from the rear of the Scanner.
7. Remove the main cover (see page 4-4).
8. Remove the safety cover **2**. (A screw holds the safety cover to the rear frame.)
9. Disconnect connectors J1, J2, J6, and J7 **1** from the device card **3**.

Note: Connector J1 is present only on 120 V ac machines.

10. Disconnect connector J3 **4** from the device card **3**.
11. Disconnect the flat cable **8** from the device card **3**.
12. Remove the two screws **6** holding the device card to the frame.
13. Remove the device card **3** from the five retainers **5**, **7**.

To reinstall, reverse the above procedures.

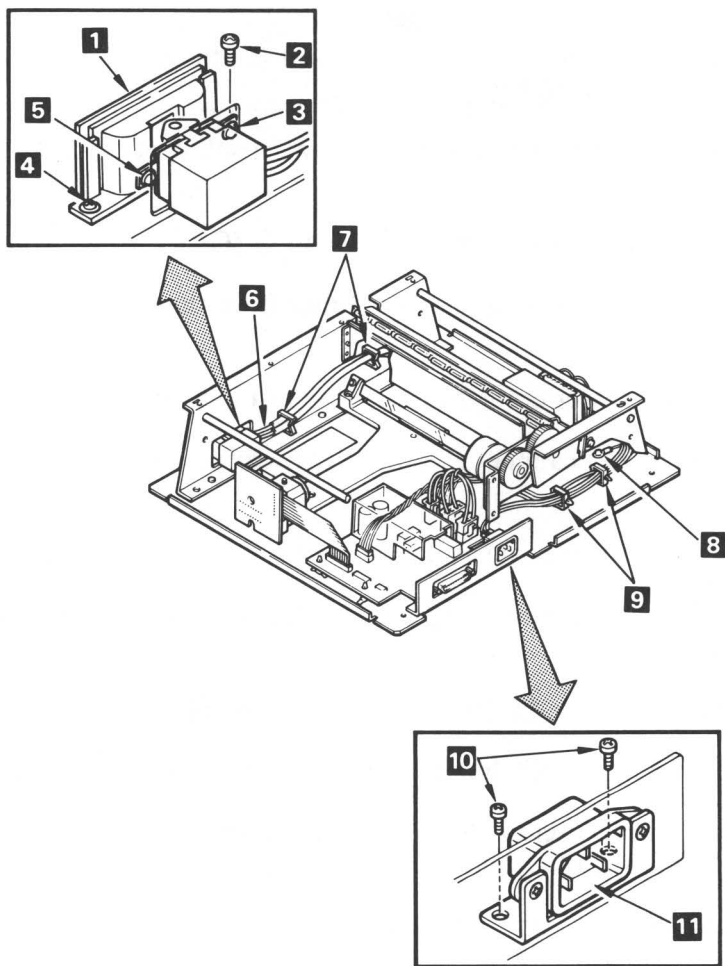


Device Card Removal

Power Switch Assembly Removal

1. Set the power switch of the system unit (and expansion unit, if attached) to **Off**.
2. Set all external power switches (printer, display, etc.) to **O** (Off).
3. Set the power switch of the Scanner to **O** (Off).
4. Unplug the power cord of the Scanner from the wall outlet.
5. Unplug the power cord from the rear of the Scanner.
6. Disconnect the scanner cable from the rear of the system unit.
7. Remove the main cover (see page 4-4).
8. Remove the device card (see page 4-14).
9. For 100 or 220/240 V ac machines only:
Disconnect connector J8 from the transformer assembly.
10. Remove the two screws **10** holding the power receptacle **11** to the bracket.
11. Remove the two screws **2** , **4** holding the power switch bracket **1** to the frame.
12. Remove the two screws **3** , **5** holding the power switch to the bracket **1** .
13. Remove the screw **8** holding the safety ground wire to the frame.
14. Remove the power cable **6** from the four clamps **7** , **9** .
15. Remove the power switch assembly.

To reinstall, reverse the above procedures.

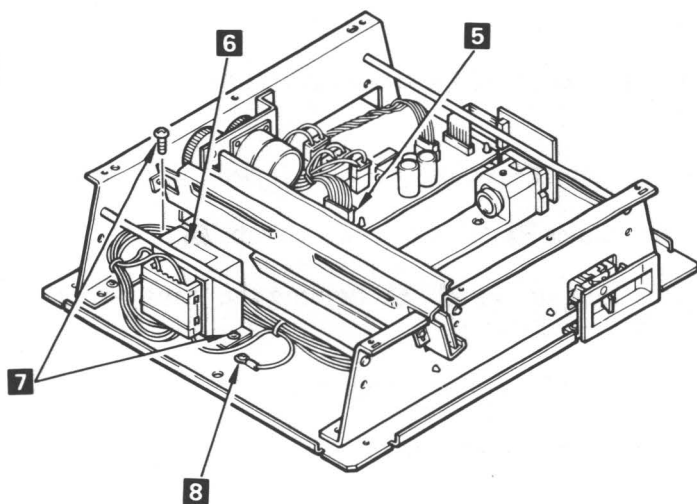
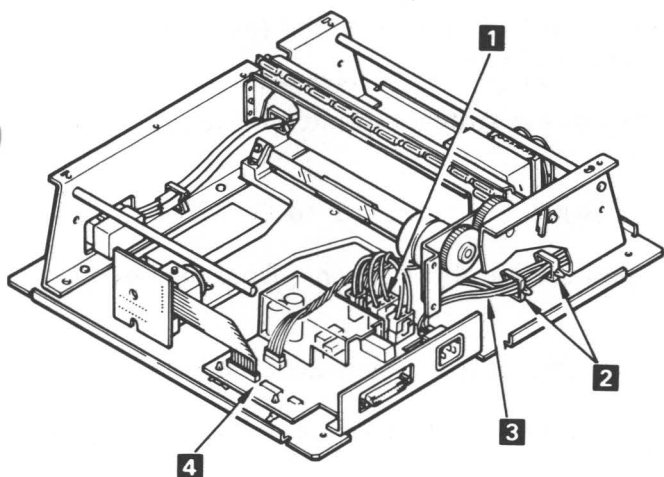


Power Switch Assembly Removal

Transformer Assembly Removal (120 V ac Machine)

1. Set the power switch of the system unit (and expansion unit, if attached) to **Off**.
2. Set all external power switches (printer, display, etc.) to **Off**.
3. Set the power switch of the Scanner to **Off**.
4. Unplug the power cord of the Scanner from the wall outlet.
5. Unplug the power cord from the rear of the Scanner.
6. Disconnect the scanner cable from the rear of the system unit.
7. Remove the main cover (see page 4-4).
8. Disconnect connectors J6 **1** and J7 **5** from the device card **4**.
9. Remove the cables **3** from the two clamps **2**.
10. Remove the screw **8** holding the shield wire to the frame.
11. Remove the two screws **7** holding the transformer assembly **6** to the frame.
12. Remove the transformer assembly **6**.

To reinstall, reverse the above procedures.

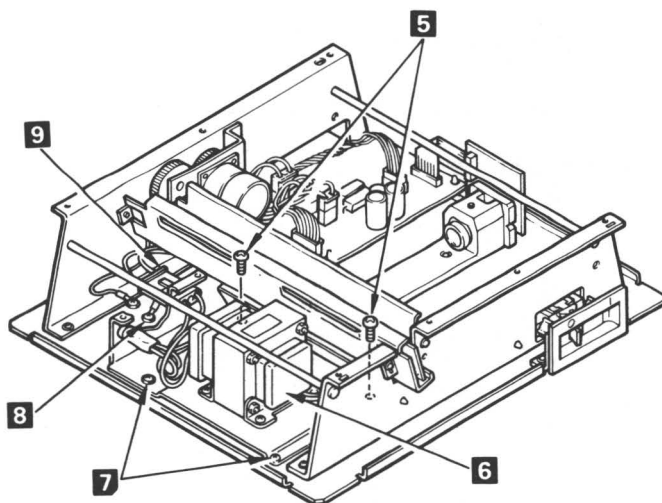
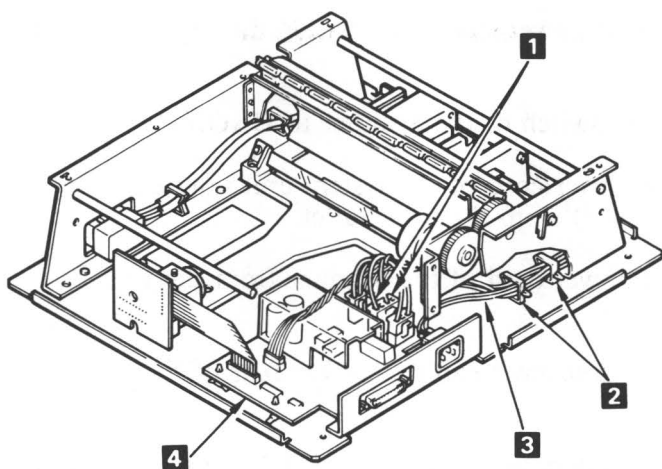


Transformer Assembly Removal (120 V ac Machine)

Transformer Assembly Removal (100, 220/240 V ac Machine)

1. Set the power switch of the system unit (and expansion unit, if attached) to **Off**.
2. Set all external power switches (printer, display, etc.) to **Off**.
3. Set the power switch of the Scanner to **Off**.
4. Unplug the power cord of the Scanner from the wall outlet.
5. Unplug the power cord from the rear of the Scanner.
6. Disconnect the scanner cable from the rear of the system unit.
7. Remove the main cover (see page 4-4).
8. Disconnect connectors J6 and J7 **1** from the device card **4**.
9. Disconnect connector J8 **9** from the transformer assembly **6**.
10. Remove the screw **8** holding the shield wire to the frame.
11. Remove the cables **3** from the two clamps **2**.
12. Remove the four screws **5**, **7** holding the transformer assembly **6** to the frame.
13. Remove the transformer assembly **6**.

To reinstall, reverse the above procedures.

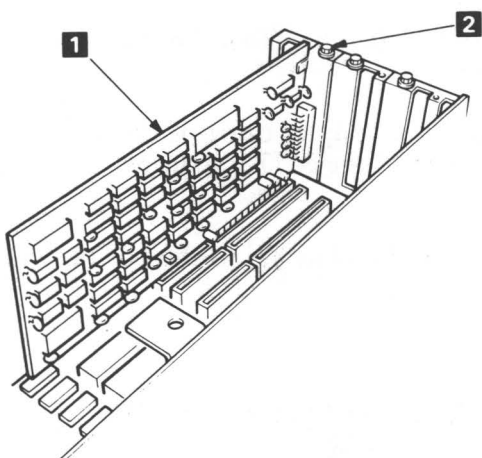


Transformer Assembly Removal (100, 220/240 V ac Machine)

3117 Scanner Adapter Removal

1. Set the power switch of the system unit (and expansion unit, if attached) to **Off**.
2. Set all external power switches (printer, display, etc.) to **O** (Off).
3. Set the power switch of the Scanner to **O** (Off).
4. Unplug the power cord of the system unit (and expansion unit, if attached) from the wall outlet.
5. Unplug the power cord of the Scanner from the wall outlet.
6. Disconnect the scanner cable from the rear of the system unit.
7. Remove the system unit cover (if needed, see the *Hardware Maintenance Service* manual of your IBM personal computer).
8. Remove the adapter mounting screw **2**.
9. Remove the adapter **1** from the system unit.

To reinstall, reverse the above procedures.

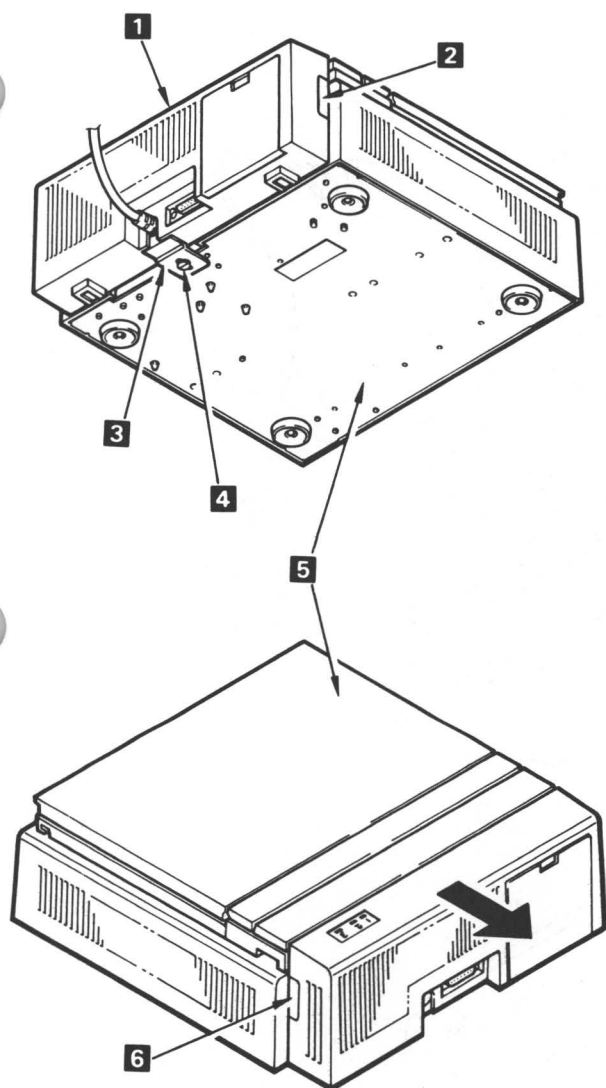


3117 Scanner Adapter Removal

3117 Extension Unit Removal

1. Set the power switch of the Scanner to **O** (Off).
2. Unplug the power cord of the Scanner from the wall outlet.
3. Disconnect the communication adapter cable of the 3117 Extension Unit from the rear of the 3117 Extension Unit **1**.
4. Remove the screw **4** holding the plate **3** to the bottom of the Scanner **5**.
5. Remove the plate **3**.
6. Push in the two buttons **2**, **6** and pull out the 3117 Extension Unit from the Scanner **5**.

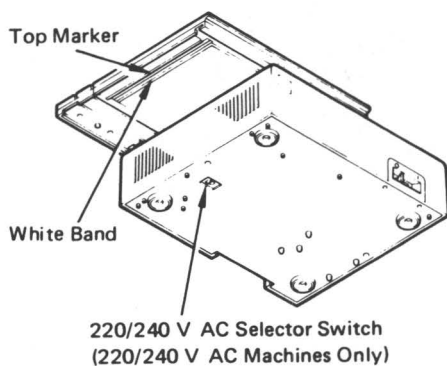
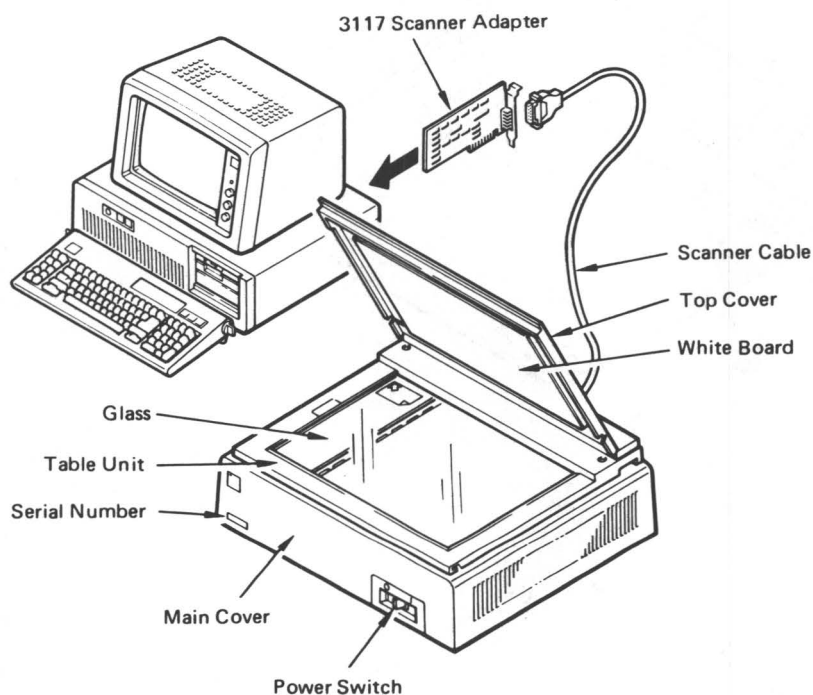
To reinstall, reverse the above procedures.



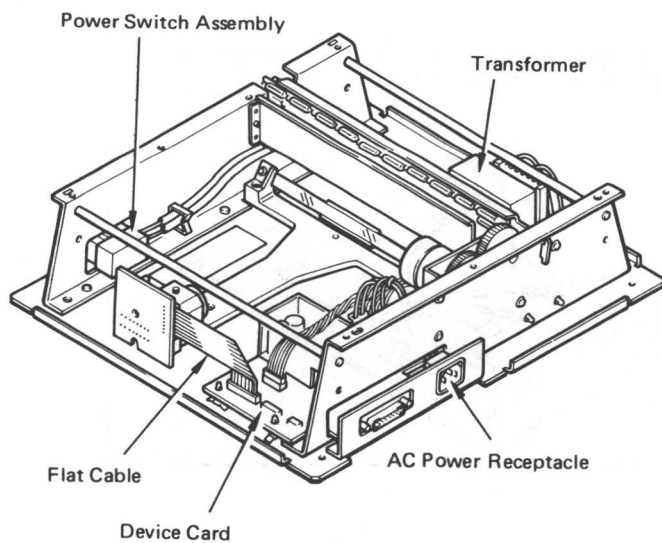
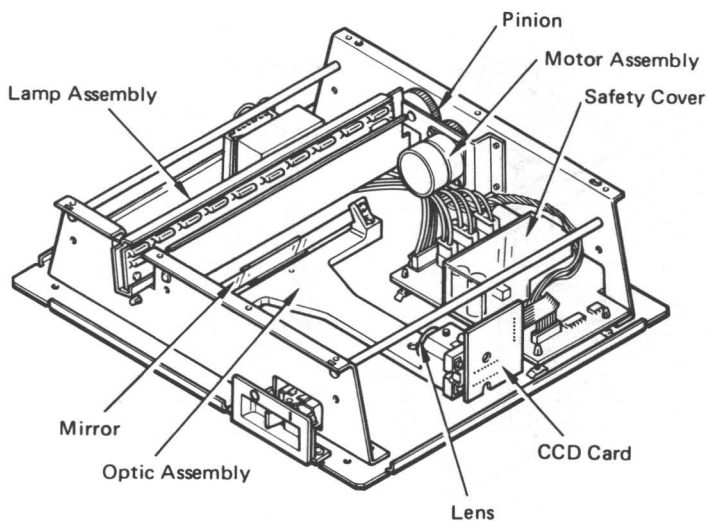
3117 Extension Unit Removal

Locations

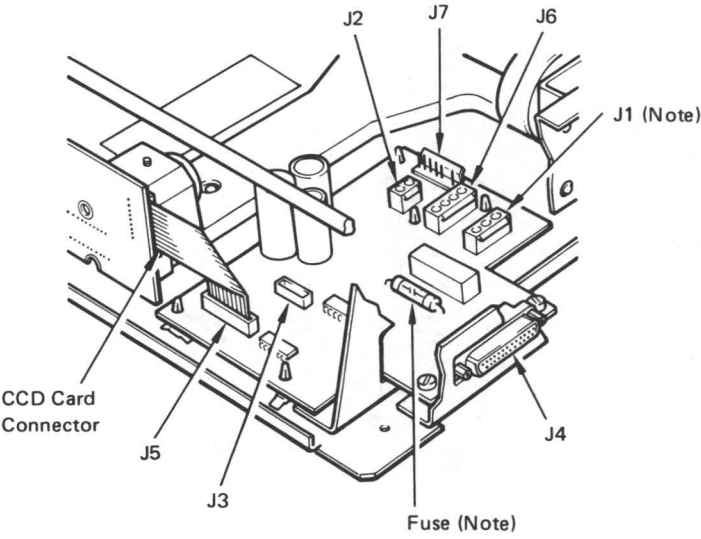
Overview



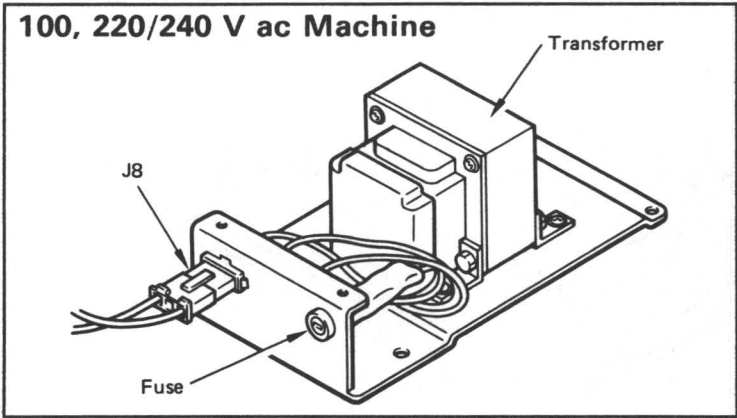
Scanner



Connectors

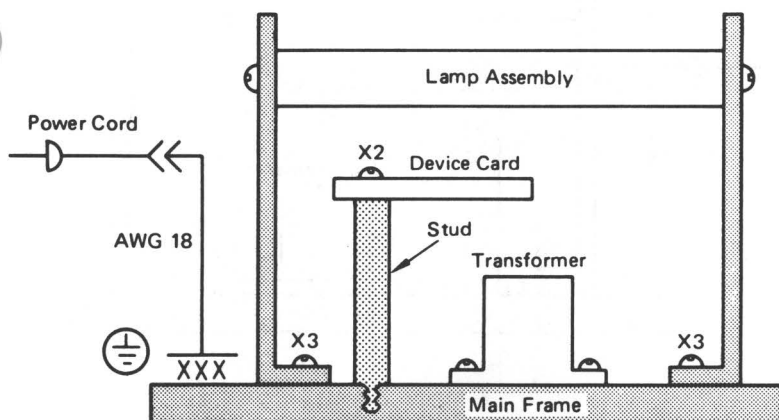


Note: Present on 120 V ac machines only.



Safety Ground

120 V ac Machine



Legend



Primary ground



Screw connection



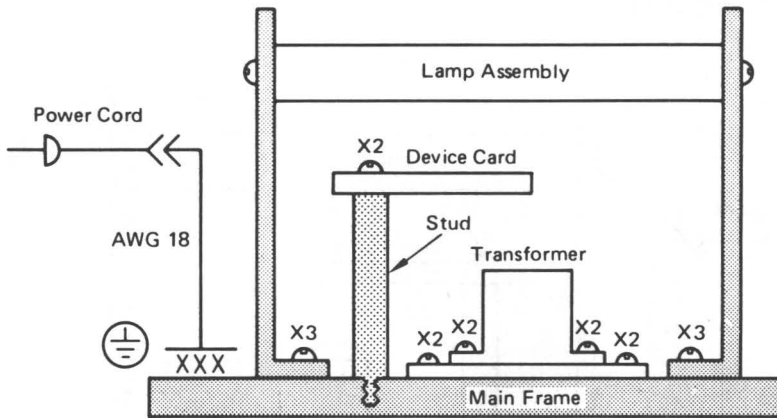
Screw connection with external toothed washer



Power plug and receptacle

Note: All screw connections shown are to complete the grounding path.

100, 220/240 V ac Machine



Legend



Primary ground



Screw connection



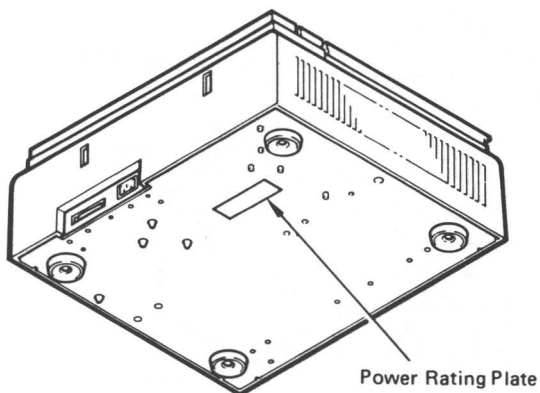
Screw connection with external toothed washer



Power plug and receptacle

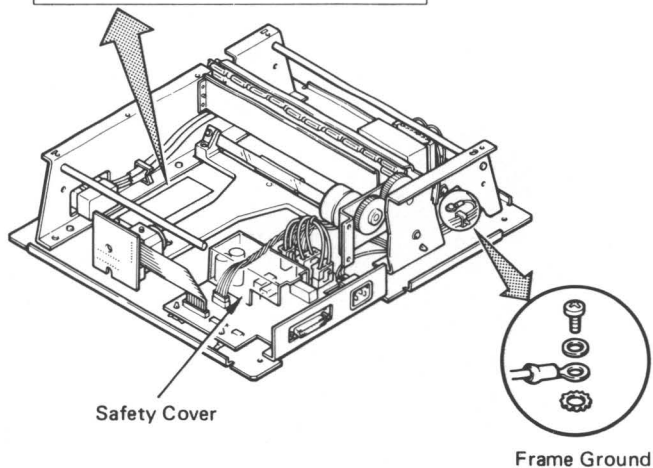
Note: All screw connections shown are to complete the grounding path.

Safety Labels

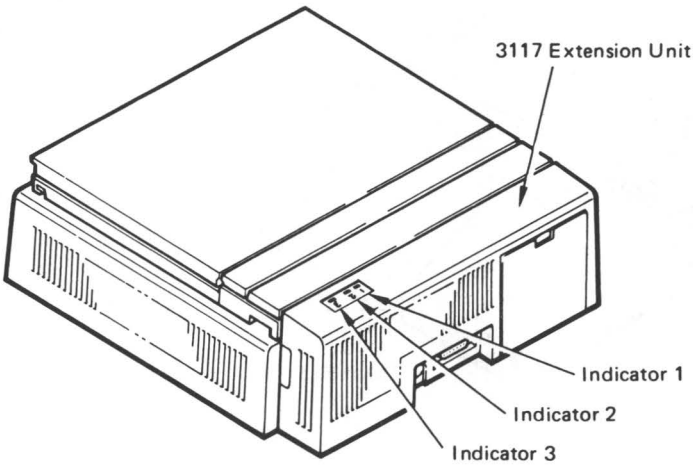


Warning Label

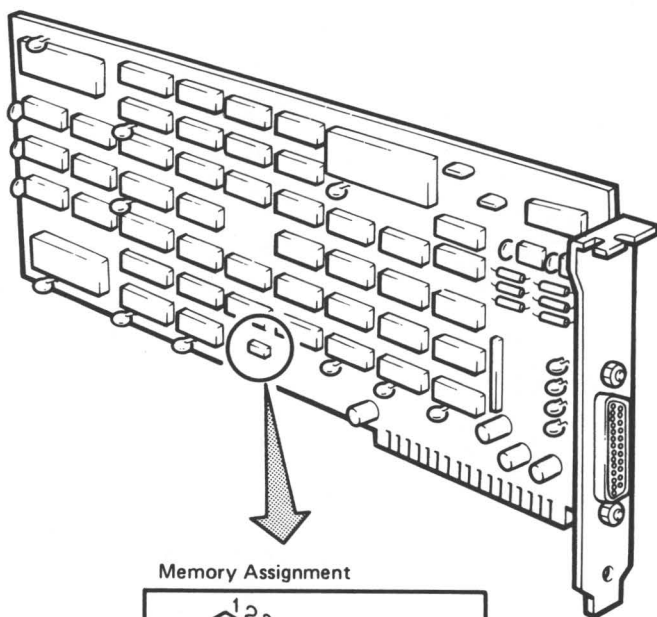
- HAZARDOUS AREA TRAINED SERVICE PERSONNEL ONLY
- ZONE DANGEREUSE PERSONNEL QUALIFIE SEULEMENT
- AREA PERIGOSA SOMENTE PESSOAL TECNICO TREINADO
- AREA PELIGROSA SOLO PERSONAL CUALIFICADO
- GEFÄHRL. BEREICH NUR FÜR FACHPERSONAL!
- 危険箇所 専門の技術員以外の取り扱い禁止



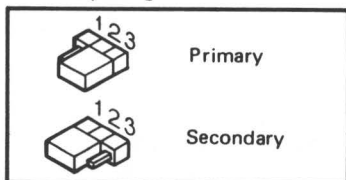
3117 Extension Unit



Section 5. Jumpers



Memory Assignment



Notes:

Section 6. Parts Catalog

Use the index number shown in the picture to locate the part numbers and description in the parts listing.

Contents

Assembly 1: Cover and Switch	6-3
Assembly 2: Scanner	6-4
Assembly 3: Adapter	6-6
Part Number Index	6-7

How to Use This Parts Catalog

NS. NS in the Asm — Index column indicates that the part is not shown in the figure. It is used for the miscellaneous parts kit.

AR. AR in the Units column indicates that the quantity of the part is used as required. It is used for the miscellaneous parts kit.

Indentures. The indenture in the description column indicates the relationship of a part to its next higher assembly. For example:

- (No dot) Main assembly
- (One dot) . Detail parts of main assembly
- (One dot) . Assembly within the main assembly

The warranty terms and conditions applicable in the country of purchase (except for the United States and Puerto Rico) for the IBM 3117 Scanner is available from the supplier.

LIMITED WARRANTY — IBM SERVICE PARTS

(Applies to the United States and Puerto Rico).

The International Business Machines Corporation warrants that each IBM Service Part will be free from defects in material and workmanship under conditions of normal use for a period of 90 days from the date of purchase from IBM or an Authorized IBM 3117 Scanner Dealer. Service Parts will be either reconditioned parts or new parts, at the option of IBM. Should an IBM Service Part fail to be free from defects in materials or workmanship during the 90-day warranty period, IBM will, at its option, repair or replace this Service Part at no charge in the United States or Puerto Rico. All replaced Service Parts will become the property of IBM. This limited warranty does not include service to repair damage to the Service Part resulting from accident, disaster, misuse, abuse, or non-IBM modification of the Product.

Limited Warranty service may be obtained by delivering the defective Service Part during the 90-day warranty period to an Authorized IBM 3117 Scanner Dealer, or any IBM Service Exchange Center in the United States or Puerto Rico. A dated proof of purchase from IBM or an Authorized IBM 3117 Scanner Dealer must accompany the claim. Contact IBM by writing to IBM National Parts Center, P.O. Box 481, Greencastle, Indiana 46135 for further information.

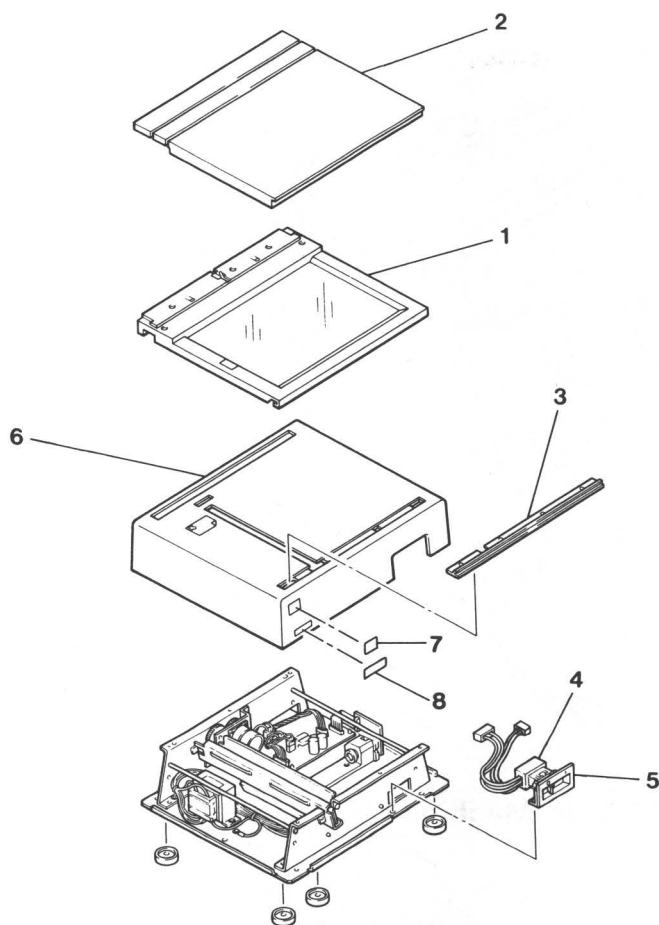
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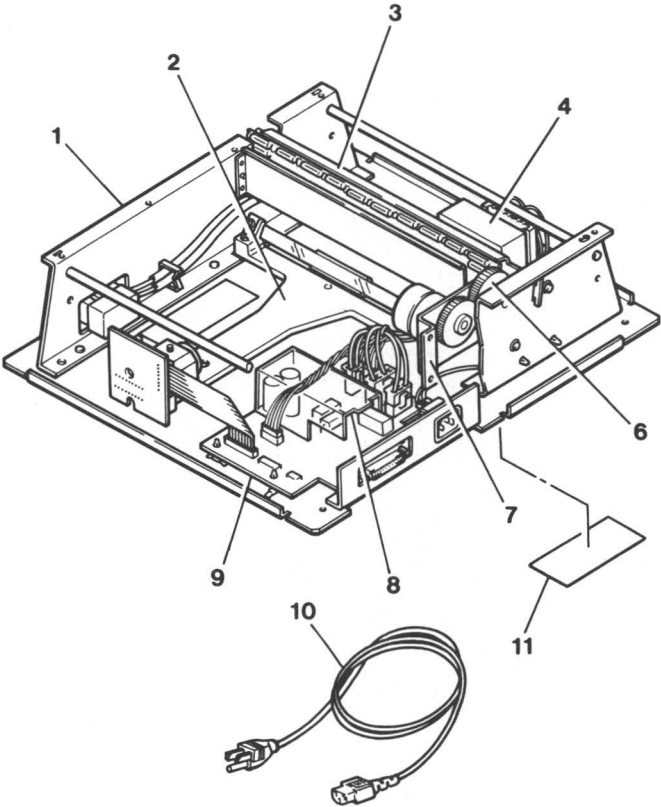
THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

Assembly 1: Cover and Switch

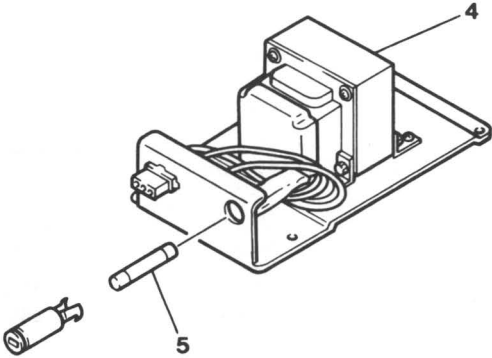


Asm — Index	Part Number	Units	Description
1 — 1	6456827	1	Table Unit
— 2	6456813	1	. Top Cover
— 3	6456815	1	Front Rail
— 4	6456820	1	Power Switch Assembly, 100, 120 V ac
	6456739	1	Power Switch Assembly, 220/240 V ac
— 5	6456814	1	Bracket — Power Switch
— 6	6456826	1	Main Cover
			Order also 1 — 7 and 1 — 8.
— 7	6456841	1	Logo, 3117
— 8	65X1773	1	Plate, Serial Number, Blank
— NS	6456812	AR	Miscellaneous Parts (see the Miscellaneous Parts in Assembly 2 for the contents)

Assembly 2: Scanner

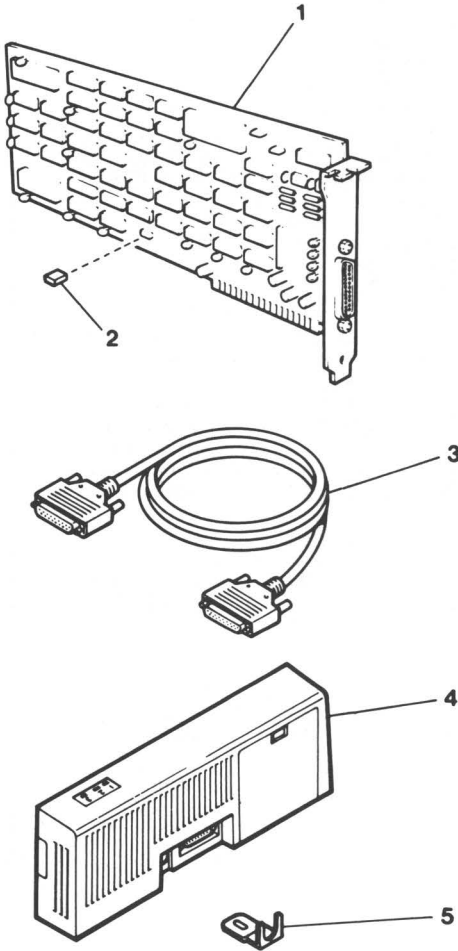


100, 220/240 V ac Machine



Asm — Index	Part Number	Units	Description
2 — 1	6456828	1	Frame Assembly 120 V ac
	6456850	1	Frame Assembly 100 V ac
	6456851	1	Frame Assembly 220/240 V ac Order also 2 — 11.
— 2	6456818	1	Optic Assembly
— 3	6456819	1	Lamp Assembly
— 4	6456824	1	Transformer Assembly 120 V ac
	6456825	1	Transformer Assembly 220/240 V ac
	6456848	1	Transformer Assembly 100 V ac
— 5	6456964	1	. Fuse, 220/240 V ac (250V, 0.63A)
	6456972	1	. Fuse, 100 V ac (250V, 1.0A)
— 6	6456849	1	Pinion, Spring, Dumper kit
— 7	6456817	1	Motor Assembly
— 8	6456821	1	Safety Cover
— 9	6456794	1	Device Card 120 V ac
	6456795	1	Device Card 100, 220/240 V ac
— 10	6952301	1	Power Cord, U.S. Canada, Japan, Korea, Taiwan, Saudi Arabia, Philippines
	1838574	1	Power Cord, Thailand
	6952291	1	Power Cord, Argentina, Paraguai, Uruai
	6952311	1	Power Cord, Australia, New Zealand
	6952320	1	Power Cord, Austria, Belgium, Finland, France Germany, Iceland, Netherlands, Norway, Portugal, Spain, Sweden, Indonesia
	6952329	1	Power Cord, Denmark
	6952347	1	Power Cord, South Africa
	6952356	1	Power Cord, U.K, Hong Kong, Malaysia, Singapore
	6952365	1	Power Cord, Switzerland
	6952374	1	Power Cord, Italy, Chile
	6952383	1	Power Cord, Israel
— 11	6456705	1	Plate, Power Rating 100 V ac
	6456755	1	Plate, Power Rating 120 V ac
	6456789	1	Plate, Power Rating 220/240 V ac
— NS	6456812	AR	Miscellaneous Parts . Stud . Flat Cable . Screw . Washer . Spacer . Foot . Clamp . Latch . Wrench

Assembly 3: Adapter



Asm — Index	Part Number	Units	Description
3 — 1	6456806	1	3117 Scanner Adapter
— 2	6455673	1	. Jumper assembly
— 3	6456807	1	Scanner Cable
— 4	6456809	1	3117 Extension Unit
— 5	6456986	1	. Bracket and screw

Part Number Index

Part Number	Asm — Index	Page
1838574	2 — 10	6 — 5
645673	3 — 2	6 — 6
6456705	2 — 11	6 — 5
6456739	1 — 4	6 — 3
6456755	2 — 11	6 — 5
6456789	2 — 11	6 — 5
6456794	2 — 9	6 — 5
6456795	2 — 9	6 — 5
6456806	3 — 1	6 — 6
6456807	3 — 3	6 — 6
6456809	3 — 4	6 — 6
6456812	1 — NS	6 — 3
6456812	2 — NS	6 — 5
6456813	1 — 2	6 — 3
6456814	1 — 5	6 — 3
6456815	1 — 3	6 — 3
6456817	2 — 7	6 — 5
6456818	2 — 2	6 — 5
6456819	2 — 3	6 — 5
6456820	1 — 4	6 — 3
6456821	2 — 8	6 — 5
6456824	2 — 4	6 — 5
6456825	2 — 4	6 — 5
6456826	1 — 6	6 — 3
6456827	1 — 1	6 — 3
6456828	2 — 1	6 — 5

Part Number	Asm — Index	Page
6456841	1 — 7	6 — 3
6456848	2 — 4	6 — 5
6456849	2 — 6	6 — 5
6456850	2 — 1	6 — 5
6456851	2 — 1	6 — 5
6456964	2 — 5	6 — 5
6456972	2 — 5	6 — 5
6456986	3 — 5	6 — 6
65X1773	1 — 8	6 — 3
6952291	2 — 10	6 — 5
6952301	2 — 10	6 — 5
6952311	2 — 10	6 — 5
6952320	2 — 10	6 — 5
6952329	2 — 10	6 — 5
6952347	2 — 10	6 — 5
6952356	2 — 10	6 — 5
6952365	2 — 10	6 — 5
6952374	2 — 10	6 — 5
6952383	2 — 10	6 — 5

Notes:

Appendix A. Maintenance Analysis Procedures (MAPs) for 3117 Extension Unit Attachment

This MAP is for service personnel who need to diagnose Scanner problems using the 3117 Extension Unit diagnostic test.

To continue in this MAP, you must have the golden 3117 Extension Unit.

Notes:



MAP 7970: Start (3117 Extension Unit Attachment)

001

- Power off the Scanner.
- Check the Scanner and make sure that there are no missing or damaged parts (covers, glass, etc.).

Also check that the top marker and white band (bottom side of the table unit's left side), and the white board (bottom side of the top cover) are clean. If these parts are not clean, the image darkness is affected.

Is any part damaged, missing, or dirty?

Yes No

002

Go to Step 004 in this MAP.

003

Go to Section 4 and replace the missing or damaged part, or clean any dirty part.

004

(From Step 002 in this MAP)

- Power off the Scanner.
- Close the top cover.
- Move the table unit by hand. The table unit can be moved manually to the right or left.

Could you move the table unit?

Yes No

005

1. Remove the main cover (see Section 4).
2. Check the following for possible defects (worn, broken, or missing):
 - Rack on the bottom side of the table unit
 - Pinion
 - Front rail.

006

- Power off the Scanner.
 - Plug in the power cord to the Scanner and wall outlet.
- (Step 006 continues)

006 (continued)

- Connect the Scanner to the golden 3117 Extension Unit.
- Move the table unit to the home position.
- Open the top cover.
- If there is any paper on the glass, remove it.
- If the communication adapter cable is connected to the 3117 Extension Unit, disconnect it.
- Power on the Scanner.

POST starts.

- Wait for approximately 10 seconds.

Did the lamp go on?

Yes No

007

Go to Step 054 in this MAP.

008

Is the lamp blinking?

Yes No

009

Go to Step 037 in this MAP.

010

Is indicator 1 blinking and indicator 2 on?

Yes No

011

Replace the following FRU one at a time in the order listed. Run the table movement test each time you replace each FRU (see "Running the Table Movement Test by the 3117 Extension Unit" on page 2-15).

1. Device card
2. Optic assembly.

012

- Close the top cover.

The table movement test starts.

Did the table move smoothly?

Yes No

013

Go to Step 031 in this MAP.

(Step 014 continues)

014

- Wait until the table unit reaches the right limit at least twice.
- If the table unit does not reach the right limit position twice, answer **No** to the next question.

Is indicator 1 blinking and indicator 2 on?

Yes No

015

Go to Step 019 in this MAP.

016

- Power off, then on the Scanner.
- Wait until indicator 1 goes on and indicator 2 goes off (approximately 7 seconds).
- Move the table unit by hand.

Could you move the table unit?

Yes No

017

Replace the device card (see Section 4).

018

The Scanner is working correctly.

019

(From Step 015 in this MAP)

- The following is the failure symptom list. Find your symptom and go to the Step listed.

Indicator 1	Indicator 2	Step
Blink	Blink	Step 020 in this MAP
On	Blink	Step 023 in this MAP
Blink	Off	Step 026 in this MAP

020

(From Step 019 in this MAP)

- Power off the Scanner.
- Check that the top marker is clean.

Is the top marker clean?

Yes No

021

(Step 021 continues)

021 (continued)

Clean the top marker (see Section 4).

- or -

Replace the table unit (see Section 4, "Main Cover Removal," steps 1 to 8).

022

Replace the following FRU one at a time in the order listed. Run the table movement test each time you replace each FRU (see "Running the Table Movement Test by the 3117 Extension Unit" on page 2-15).

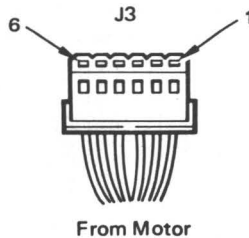
1. Device card
2. Optic assembly.

023

(From Step 019 in this MAP)

- Power off the Scanner.
- Remove the main cover (see Section 4).
- Disconnect connector J3 from the device card.
- Measure the resistances between the points listed below.

Points	Ohms
J3-1, J3-2	40 - 100
J3-2, J3-3	40 - 100
J3-4, J3-5	40 - 100
J3-5, J3-6	40 - 100



Are the resistances within the correct range?

Yes No

024

Replace the motor assembly (see Section 4).

025

Replace the following FRU one at a time in the order listed. Run the table movement test each time you replace each FRU (see "Running the Table Movement Test by the 3117 Extension Unit" on page 2-15).

1. Device card
2. Motor assembly.

026

(From Step 019 in this MAP)

- Power off the Scanner.

Are the top marker and white band clean?

Yes No

027

Clean the top marker and white band (see Section 4).

- or -

Replace the table unit (see Section 4, "Main Cover Removal," steps 1 to 8).

028

- Remove the main cover (see Section 4).
- Inspect the mirror and lens on the optic assembly.

Are the mirror and lens clean and defect free?

Yes No

029

Clean the mirror and lens on the optic assembly (see Section 4).

- or -

Replace the optic assembly (see Section 4).

030

Replace the following FRU one at a time in the order listed. Run the table movement test each time you replace each FRU (see "Running the Table Movement Test by the 3117 Extension Unit" on page 2-15).

1. Device card
2. Optic assembly
3. Transformer assembly.

031

(From Step 013 in this MAP)

- Open the top cover.

Is the lamp blinking?

Yes No

032

Go to Step 034 in this MAP.

033

(Step 033 continues)

033 (continued)

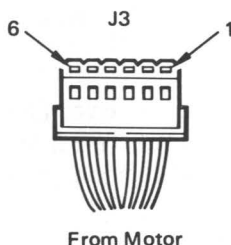
Go to Step 040 in this MAP.

034

(From Step 032 in this MAP)

- Power off the Scanner.
- Remove the main cover (see Section 4).
- Disconnect connector J3 from the device card.
- Measure the resistances between the points listed below.

Points	Ohms
J3-1, J3-2	40 - 100
J3-2, J3-3	40 - 100
J3-4, J3-5	40 - 100
J3-5, J3-6	40 - 100



Are the resistances within the correct range?

Yes No

035

Replace the motor assembly (see Section 4).

036

Replace the following FRU one at a time in the order listed.
Run the table movement test each time you replace each FRU
(see "Running the Table Movement Test by the 3117
Extension Unit" on page 2-15).

1. Device card
 2. Transformer assembly.
-

037

(From Step 009 in this MAP)

Is the lamp on?

Yes No

038

Go to Step 040 in this MAP.

039

(Step 039 continues)

039 (continued)

Replace the device card (see Section 4).

040

(From Steps 033 and 038 in this MAP)

Is the white board on the bottom side of top cover clean?

Yes No

041

Clean the white board (see Section 4).

- or -

Replace the top cover (see Section 4, "Main Cover Removal," steps 1 to 6).

042

- Power off the Scanner.
- Remove the main cover (see Section 4).
- Inspect the mirror and lens on the optic assembly.

Are the mirror and lens clean?

Yes No

043

Clean the mirror and lens on the optic assembly (see Section 4).

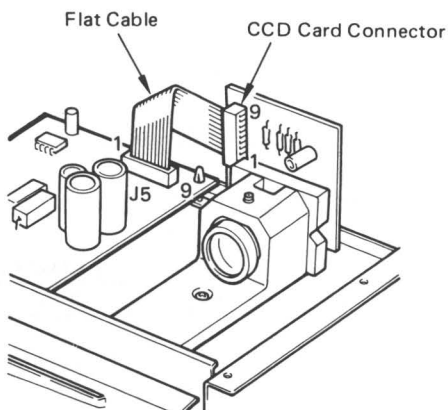
- or -

Replace the optic assembly (see Section 4).

044

- Check the continuity of the flat cable between the points listed below. The meter should indicate between 0 to 1 ohms resistance.

CCD Card Connector	Connector J5
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9



(Step 044 continues)

044 (continued)

Is the continuity of the flat cable correct?

Yes No

045

Replace the flat cable.

046

- Disconnect connectors J6 and J7 from the device card.
- Measure the resistance between the points listed below.

120 V ac Machine

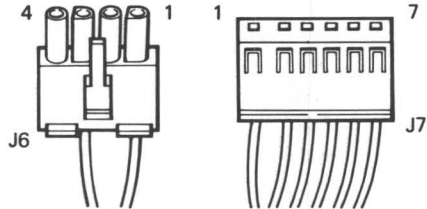
Points	Ohms
J6-1, J6-3	7 - 13
J7-1, J7-3	0.5 - 2.0
J7-4, J7-5	1.5 - 3.5
J7-6, J7-7	6 - 11

220/240 V ac Machine

Points	Ohms
J6-1, J6-3	18 - 33
J7-1, J7-3	0.5 - 2.0
J7-4, J7-5	1.0 - 2.5
J7-6, J7-7	7 - 13

100 V ac Machine

Points	Ohms
J6-1, J6-3	7 - 13
J7-1, J7-3	0.5 - 2.0
J7-4, J7-5	1.5 - 3.5
J7-6, J7-7	6 - 12



From Transformer

Are all the resistances correct?

Yes No

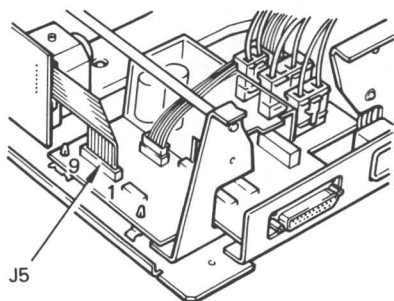
047

Replace the transformer assembly (see Section 4).

048

- Reconnect connector J6 and J7 to the device card.
- Power on the Scanner.
- Measure the **DC** voltage between the points listed below.

+Lead	-Lead	Min V dc	Max V dc
J5-5	J5-3	10.8	13.2



Is the voltage within the correct range?

Yes No

049

Go to Step 051 in this MAP.

050

Replace the following FRU one at a time in the order listed. Run the table movement test each time you replace each FRU (see "Running the Table Movement Test by the 3117 Extension Unit" on page 2-15).

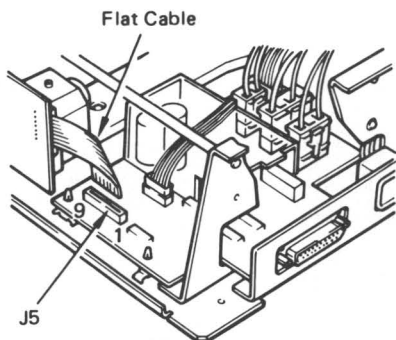
1. Device card
2. Optic assembly.

051

(From Step 049 in this MAP)

- Power off the Scanner.
- Disconnect the flat cable from the device card.
- Power on the Scanner.
- Measure the **DC** voltage between the points listed below.

+Lead	-Lead	Min V dc	Max V dc
J5-5	J5-3	10.8	13.2



Is the voltage within the correct range?

Yes No

052

Replace the device card (see Section 4).

053

Replace the following FRU one at a time in the order listed.
Run the table movement test each time you replace each FRU
(see "Running the Table Movement Test by the 3117
Extension Unit" on page 2-15).

1. Optic assembly
2. Device card.

054

(From Step 007 in this MAP)

Is indicator 3 on?

Yes No

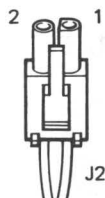
055

Go to Step 061 in this MAP.

056

- Power off the Scanner.
- Disconnect the 3117 Extension Unit from the Scanner.
- Disconnect the power cord from the wall outlet and Scanner.
- Remove the main cover (see Section 4).
- Disconnect connector J2 from the device card.
- Measure the resistance between the points listed below.

Points	Ohms
J2-1, J2-2	10 - 100



From Lamp

Is the resistance within the correct range?

Yes No

057

Replace the lamp assembly (see Section 4).

058

- Disconnect connectors J6 and J7 from the device card.
- Measure the resistances between the points listed below.

120 V ac Machine

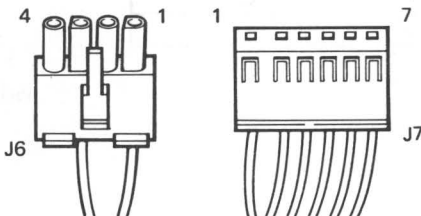
Points	Ohms
J6-1, J6-3	7 - 13
J7-1, J7-3	0.5 - 2.0
J7-4, J7-5	1.5 - 3.5
J7-6, J7-7	6 - 11

220/240 V ac Machine

Points	Ohms
J6-1, J6-3	18 - 33
J7-1, J7-3	0.5 - 2.0
J7-4, J7-5	1.0 - 2.5
J7-6, J7-7	7 - 13

100 V ac Machine

Points	Ohms
J6-1, J6-3	7 - 13
J7-1, J7-3	0.5 - 2.0
J7-4, J7-5	1.5 - 3.5
J7-6, J7-7	6 - 12



From Transformer

Are all the resistances correct?

Yes No

059

Replace the transformer assembly (see Section 4).

060

Replace the device card (see Section 4).

061

(From Step 055 in this MAP)

- Power off the Scanner.
- Disconnect the 3117 Extension Unit from the Scanner.
- Disconnect the power cord from the wall outlet and Scanner.
- Check the continuity of the power cord.

Is the continuity of the power cord correct?

Yes No

062

Replace the power cord.

063

If you are servicing a 120 V ac machine, go to Step 064 in this MAP.

- or -

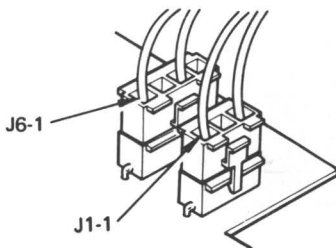
If you are servicing a 100 or 220/240 V ac machine, go to Step 076 in this MAP.

064

(From Step 063 in this MAP)

- Remove the main cover (see Section 4).
- Check that connectors J1, J2, J3, J5, J6, and J7 are tightly connected to the device card.
- Measure the resistance between the points listed below.

Points	Ohms
J1-1, J6-1	0 - 1



Is the resistance between 0 to 1 ohms?

Yes No

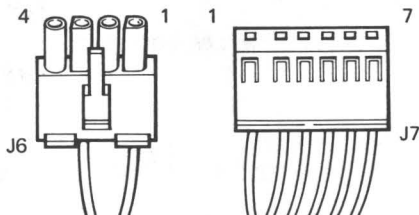
065

Go to Step 071 in this MAP.

066

- Disconnect connectors J6 and J7 from the device card.
- Measure the resistances between the points listed below.

Points	Ohms
J6-1, J6-3	7 - 13
J7-1, J7-3	0.5 - 2.0
J7-4, J7-5	1.5 - 3.5
J7-6, J7-7	6 - 11



From Transformer

Are all the resistances correct?

Yes No

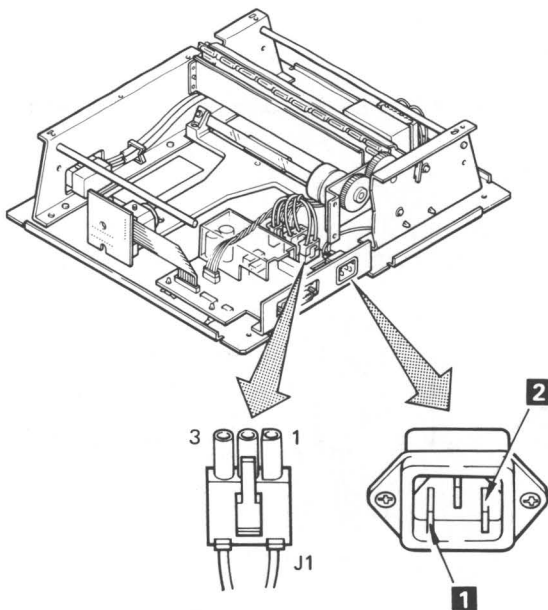
067

Replace the transformer assembly (see Section 4).

068

- Disconnect connector J1 from the device card.
- Measure the resistance between the points listed below.

Points	Power Switch	Ohms
J1-1, 2	I (On)	0 - 1
J1-1, 2	O (Off)	Infinite
J1-3, 1	I (On)	0 - 1
J1-3, 1	O (Off)	Infinite



From Power Switch

(Step 068 continues)

068 (continued)

Are all the resistances correct?

Yes No

069

Replace the power switch assembly (see Section 4).

070

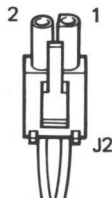
Replace the device card (see Section 4).

071

(From Step 065 in this MAP)

- Disconnect connector J2 from the device card.
- Measure the resistance between the points listed below.

Points	Ohms
J2-1, J2-2	10 - 100



From Lamp

Is the resistance more than 10 ohms?

Yes No

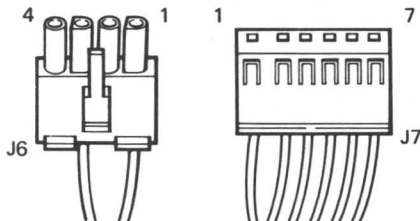
072

Replace the lamp assembly and device card (see Section 4).

073

- Disconnect connectors J6 and J7 from the device card.
- Measure the resistances between the points listed below.

Points	Ohms
J6-1, J6-3	7 - 13
J7-1, J7-3	0.5 - 2.0
J7-4, J7-5	1.5 - 3.5
J7-6, J7-7	6 - 11



From Transformer

(Step 073 continues)

073 (continued)

Are all the resistances correct?

Yes No

074

Replace the transformer assembly and device card (see Section 4).

075

Replace the device card (see Section 4).

076

(From Step 063 in this MAP)

- Remove the main cover (see Section 4).
- Check that connector J8 is tightly connected to the transformer assembly.
- Check that connectors J2, J3, J5, J6, and J7 are tightly connected to the device card.
- Check the continuity of the fuse on the transformer assembly.

Is the fuse open?

Yes No

077

Go to Step 083 in this MAP.

078

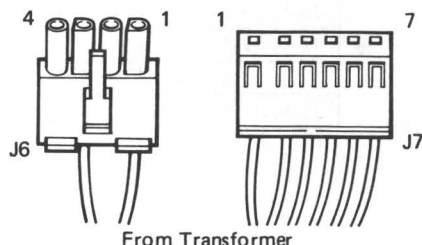
- Disconnect connectors J6 and J7 from the device card.
- Measure the resistance between the points listed below.

220/240 V ac Machine

Points	Ohms
J6-1, J6-3	18 - 33
J7-1, J7-3	0.5 - 2.0
J7-4, J7-5	1.0 - 2.5
J7-6, J7-7	7 - 13

100 V ac Machine

Points	Ohms
J6-1, J6-3	7 - 13
J7-1, J7-3	0.5 - 2.0
J7-4, J7-5	1.5 - 3.5
J7-6, J7-7	6 - 12



(Step 078 continues)

078 (continued)

Are all the resistances correct?

Yes No

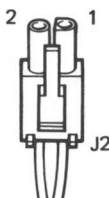
079

Replace the transformer assembly (see Section 4).

080

- Disconnect connector J2 from the device card.
- Measure the resistance between the points listed below.

Points	Ohms
J2-1, J2-2	10 - 100



From Lamp

Is the resistance more than 10 ohms?

Yes No

081

Replace the lamp assembly and the fuse on the transformer assembly (see Section 4).

082

Replace the fuse on the transformer assembly.

083

(From Step 077 in this MAP)

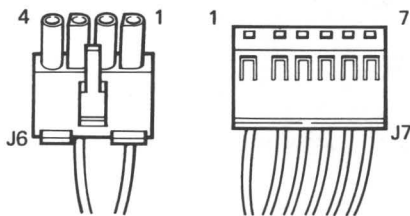
- Disconnect connectors J6 and J7 from the device card.
- Measure the resistance between the points listed below.

220/240 V ac Machine

Points	Ohms
J6-1, J6-3	18 - 33
J7-1, J7-3	0.5 - 2.0
J7-4, J7-5	1.0 - 2.5
J7-6, J7-7	7 - 13

100 V ac Machine

Points	Ohms
J6-1, J6-3	7 - 13
J7-1, J7-3	0.5 - 2.0
J7-4, J7-5	1.5 - 3.5
J7-6, J7-7	6 - 12



From Transformer

Are all the resistances correct?

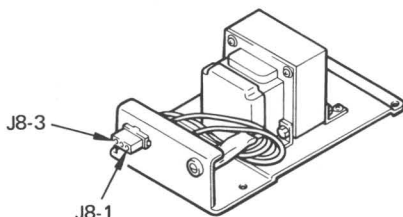
Yes No

084

Replace the transformer assembly (see Section 4).

085

- Disconnect connector J8 from the transformer assembly.
- Measure the resistance between J8-1 and J8-3 at the transformer assembly side for 10 to 30 ohms.



Is the resistance between 10 and 30 ohms?

Yes No

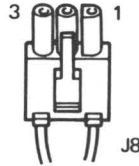
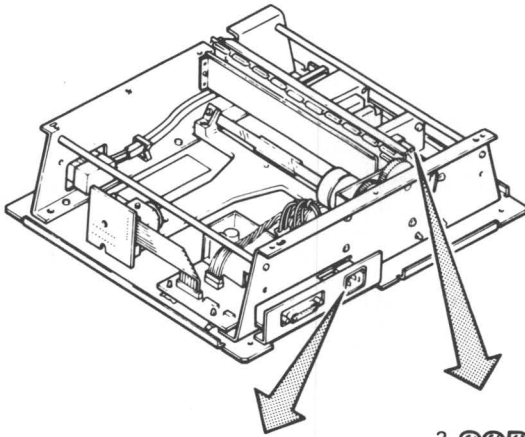
086

Replace the transformer assembly (see Section 4).

087

- Measure the resistance between the points listed below.

Points	Power Switch	Ohms
J8-1, 2	I (On)	0 - 1
J8-1, 2	O (Off)	Infinite
J8-3, 1	I (On)	0 - 1
J8-3, 1	O (Off)	Infinite



From Power Switch

Are all the resistances correct?

Yes **No**

088

Replace the power switch assembly (see Section 4).

089

Replace the device card (see Section 4).

Appendix B. Sample Chart

Use the next page as a sample for scanning.

Top of Sample Chart

ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890ABCDEFGHIJKLMNOPQRSTUVWXYZ

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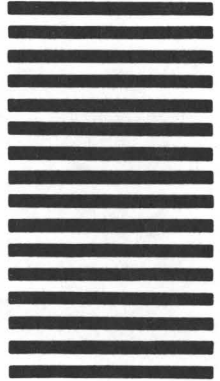
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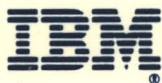


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